

1945.

QUEENSLAND.



ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE
AND STOCK

FOR

THE YEAR 1944-45.

PRESENTED TO PARLIAMENT BY COMMAND.

BRISBANE :
BY AUTHORITY: A. H. TUCKER, GOVERNMENT PRINTER.

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ADVISORY AND TECHNICAL SERVICES

Under Secretary	R. P. M. Short
Asst. Under Secretary (Technical)	A. F. Bell, M.Sc., D.I.C., A.A.C.I.
Asst. Under Secretary (Administrative)	M. L. Cameron
Special Administrative Officer	H. Barnes
Division of Plant Industry—	
Director of Plant Industry	R. Veitch, B.Sc.Agr., B.Sc.For., F.R.E.S.
Specialist Adviser, Experiment Stations, and Cotton Specialist	W. G. Wells
Agriculture Branch—	
Director of Agriculture	C. J. McKeon, Q.D.A.
Asst. Director of Agriculture	D. O. Atherton, Q.D.A., M.Sc.Agr. (on Military Service)
Chief Adviser	W. H. Bechtel
Chemical Laboratory—	
Agricultural Chemist	M. White, M.Sc., Ph.D., A.A.C.I.
O/C Plant Nutrition Section	C. R. von Stieglitz, F.A.C.I.
Horticulture Branch—	
Director of Horticulture	W. A. T. Summerville, D.Sc.
Assistant Director	S. A. Trout, M.Sc., Ph.D.
Science Branch—	
Senior Entomologist	J. H. Smith, N.D.A., M.Sc.
Government Botanist	C. T. White
Senior Pathologist	J. H. Simmonds, M.B.E., M.Sc. (on Military Service)
Sugar Experiment Stations—	
Director	A. F. Bell, M.Sc., D.I.C., A.A.C.I.
Asst. Director and Chief Mill Technologist	E. R. Behne, B.Sc., M.Sc.App., A.A.C.I.
O/C Entomology and Pathology	R. W. Mungomery
Division of Animal Industry—	
Acting Director of Animal Industry	J. Legg, B.Sc., D.V.Sc., M.R.C.V.S.
Chief Inspector of Stock and Chief Inspector of Slaughter-houses	L. D. Carey
Acting Director of Research	F. H. S. Roberts, D.Sc.
Senior Adviser, Sheep and Wool	J. L. Hodge
Veterinary Officer, Sheep and Wool Branch	G. R. Moule, B.V.Sc.
Officer in Charge, Pig Branch	F. Bostock
Officer in Charge, Poultry Branch	P. Rumball, R.D.A.
Division of Dairying—	
Director of Dairying	E. B. Rice, Dip.Ind. Chem.
Senior Dairy Technologist	O. St. J. Kent, B.Sc., A.A.C.I.
Marketing Division—	
Director of Marketing	H. S. Hunter
Acting Asst. Director of Marketing	H. K. Lewcock, B.Sc.Agr., M.Sc.
Standards Officer	F. B. Coleman
Publications—	
Editor	J. F. F. Reid
Associate Editor	C. W. Winders, B.Sc.Agr.

REPORT OF THE DEPARTMENT OF AGRICULTURE AND STOCK FOR THE YEAR 1944-45.

TO THE HONOURABLE THE SECRETARY FOR AGRICULTURE AND STOCK.

SIR,—I have the honour to submit herewith the Annual Report of the Department of Agriculture and Stock for the year ended 30th June, 1945.

SEASONAL CONDITIONS.

A State-wide rainfall distribution under out-of-season influences occurred in July, 1944, and enhanced earlier seasonal prospects throughout the Darling Downs and South Coast districts. Pastoral districts had temporarily useful rains, but neither heavy nor continuous enough to induce much growth of grass and herbage. There was a beneficial rain period in August with over-average falls in agricultural and some pastoral areas, and which gave partial but belated relief to the South-West pastoral region where dry weather had prevailed for a long period. In September, there was a fairly general storm distribution. Favourable conditions continued in agricultural and dairying districts, chiefly as a result of the substantial winter rains. Little or no rain fell over the greater portion of the inland pastoral country. October rainfalls were under-average throughout the State except in a few localities. A marked and rapid deterioration of already adverse seasonal conditions was the experience in November until relieved substantially by a series of storms which occurred late in the month, chiefly in the agricultural and dairying districts, although southern and central inland pastoral areas also benefited considerably. There were further thunderstorm rains in many parts of the State in December, with the usual variability in volume and location at that time of the year. During this month most of the tropical territory had over-average falls ranging up to 13 inches in the Far North. Dry conditions continued in the South-West where the temporary benefit of the light spring rains had quickly evaporated.

In January, only one district in the Far North had above-average rainfall. Quickly drying pastures in most parts of the State were then in need of normal seasonal general soaking rains. Abnormally dry weather continued in the South-West, where only an aggregate of from five to eight inches had been recorded in 1944. February was a month of heavy and continuous flood rains of cyclonic origin. At Ingham, a record fall for one day of nearly 19 inches was recorded on the 2nd. Inland pastoral areas benefited partially, but general monsoonal rains were still delayed. In March, however, rainfalls were well over normal aggregates, swelling to heavy flood totals in the northern and central coastal divisions, but in many inland pastoral areas there was general rain deficiency. April rains also were above-average in parts of the State, especially in the North, but there were no useful falls in the dry southern border country. A fairly general rainfall distribution occurred late in May, as a result of delayed monsoonal influences. Temperatures were mild and the winter outlook had improved in many pastoral areas. Soaking rains were still needed in the Central-West and South-West. Good growing conditions were experienced in the main agricultural districts. The beneficial weather break towards the end of that month continued well into June, especially in the farming and dairying country, although in places, particularly around Port Curtis, the rainfall was below normal. In the South-West, falls were only light and patchy and the winter prospect was bleak. The general pastoral outlook from the Central-West to the coast had, however, definitely improved. For the agricultural and dairying industries the general seasonal prospect was bright, particularly in the Darling Downs and Moreton districts. In the coastal country in the South-East, the June rainfall was very heavy—three-day aggregates ranging from 10 to 15 inches in places. The Darling Downs had widely distributed and copious winter rains, as much as seven inches

in places, and consequently a heavy harvest of grain and fodder crops and a substantial increase in dairy production are now assured.

DEPARTMENTAL REORGANIZATION.

In order to provide for more extensive advisory and research services and facilities to the land industries of the State in the post-war period, the Government of Queensland sanctioned a plan, which has since been applied, for the complete reorganization of the Department of Agriculture and Stock.

In the reorganized Department, all branches with common interests are now grouped within a division under the control of a director who is responsible for co-ordinating branch activities. Some amalgamation of former branches and sections has been made and there has been a re-allocation of responsibilities. The grouping of branches in a limited number of divisions with clearly-defined duties is intended to eliminate overlapping and facilitate efficient handling of the problems associated with the primary industries of the State. The five divisions now established are: The Division of Administration, the Division of Plant Industry, the Division of Animal Industry, the Division of Dairying and the Division of Marketing.

In designing the structure of the technical divisions, the policy has been to make them as self-contained as practicable, in order to facilitate close and rapid co-operation in advisory and investigational work.

The officers chosen to administer and direct the work of each division and its branches and sections have an extensive knowledge of the science and practice of agriculture and livestock husbandry, and many have had, in addition, experience of rural industry in other lands. The technical workers in every division have all been suitably trained, or will receive special training, for the tasks to which they have been assigned.

In the Division of Administration, two Assistant Under Secretaries have been appointed, one to supervise the activities of the technical divisions (Plant Industry, Animal Industry and Dairying) and the other the work of the Divisions of Administration and Marketing. In addition, a Special Administrative Officer with senior status has been attached to the central administration for particular and emergency duties.

The Division of Plant Industry is comprised of five branches—Agriculture (excluding sugar-cane growing), Horticulture, Science, Chemical Laboratory, and the Bureau of Sugar Experiment Stations. The Director of the Division has associated with him certain specialist advisers who are regarded as authorities on problems common to several branches, such as soil conservation, irrigation, and biometrics. The Agriculture and Horticulture Branches will carry on both research and extension activities with provision for effective liaison between them. By virtue of its special constitution, the Bureau of Sugar Experiment Stations will continue to maintain its own soils, pathology, entomology and mill technology laboratories. In the field, each production branch of the Division is organized on a district basis with a senior adviser in charge of each district, the advisers stationed in sub-districts being under his direct control. Included in the Science Branch are three sections—Pathology, Entomology and Botany—the head of one section being also the administrative head of the branch.

The Division of Animal Industry contains the several branches of animal husbandry, and includes the Veterinary Research Branch and a Biochemical Laboratory. For the

whole of the State, the boundaries of five divisions have been fixed, each in charge of a divisional veterinary officer who, through the district officers, will control the activities of the field staff—veterinary officers, advisers, and inspectors—within the divisional area. In the Veterinary Research Branch is incorporated the Animal Health Stations at Yeerongpilly and Oonoonba. All matters pertaining to animal health, husbandry and breeding will be the responsibility of this Division.

The Division of Dairying is responsible for dairy hygiene, grading, herd testing, and all matters relating to transport, manufacture and preservation of dairy products. Within this Division is the Dairy Research Branch with chief and subsidiary laboratories in which is carried on the technical work necessary for the control of the liquid milk supply. As with the other production divisions, the field organization of the Division of Dairying is on a district basis with senior advisers, controlling local advisers and dairy officers, all of whom will continue to work in close association with butter and cheese manufacturers and milk distributors.

The organization of the Division of Marketing comprises the Marketing and Economics Branch and the Standards Branch. The firstnamed is charged with the administration of legislation relating to farmers' co-operative associations, the marketing of primary products, and the development generally of organised marketing. The Standards Branch ensures the maintenance of standards in respect of the requirements of rural industries in relation particularly to pure seeds, fertilizers, pest destroyers, stock foods and veterinary medicines; this branch also is charged at the present time with the administration of stock food rationing schemes.

Of the officers controlling the several divisions and their branches, no fewer than eighteen hold university degrees, five hold diplomas from technical institutions and sixteen have had the advantage of overseas study and experience.

The scheme of reorganization is complete, in so far as war-time staff difficulties have permitted. More than 25 per cent. of the departmental officers are still absent on defence or other national service duties while, in common with other institutions, recruitment has been negligible over the past five years. Some considerable time, therefore, must elapse before all the proposals embodied in the scheme of reorganization are brought to full fruition.

POST-WAR PROBLEMS.

The Department has co-operated extensively with other Government Departments in devising measures for dealing with post-war problems and in planning realizable projects for land use and development.

The Assistant Under Secretary (Technical) has been appointed Deputy Chairman of the Bureau of Investigation constituted under the *Land and Water Resources Development Act of 1943*. This Bureau is charged with the responsibility of carrying on continuous investigation of the natural resources of the State, and of recommending practical means for their effective conservation and economic utilization.

The Director of Agriculture is a member of the Soldiers' Settlement Land Selection Committee, which has been appointed by the Honourable the Minister for Lands to advise his Department on the administration of soldier settlement projects. It is expected that the Department of Agriculture and Stock will be called on to assist in the selection of suitable farms in conformity with the Commonwealth Government scheme for pre-settlement training of ex-Servicemen.

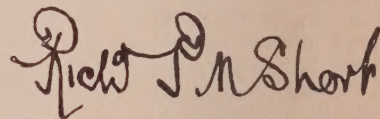
The Department is also represented on the Committee of Enquiry which has been appointed by the Government to investigate the conditions of, and to advise on, practical means for the improvement and extension of agricultural education in Queensland.

DIVISIONAL REPORTS.

Detailed reviews of the work of the Department during the year are contained in the annexed reports of the Director of the Division of Plant Industry, the Director of the Division of Animal Industry, the Director of the Division of Dairying and the Director of the Division of Marketing.

I am, Sir,

Yours faithfully,



Under Secretary, Department of Agriculture and Stock.

REPORT OF THE DIRECTOR, DIVISION OF PLANT INDUSTRY,

Executive Council approval was obtained in December, 1944, for the adoption of the plan of reorganization of the Department of Agriculture and Stock, as submitted by the Public Service Commissioner, and in May, 1945, a large number of vacancies, arising out of that reorganization, were filled by the Council. These facts necessitate a complete recasting of the annual report in so far as all plant industry activities are concerned and these are now reviewed, in general terms, by the Director, Division of Plant Industry. The work of the 1944-45 departmental year is then discussed in greater detail in the accompanying reports submitted by the heads of the various branches of the division, namely, the Specialist Adviser, Experiment Stations and Cotton Specialist, the Director of Agriculture, the Director of Horticulture, the Officer-in-charge, Science Branch, and the Agricultural Chemist and Bio-Chemist. Although the reorganization of the Department provides for the inclusion of the Bureau of Sugar Experiment Stations in the Division of Plant Industry the activities of the Bureau are reported on elsewhere by the Director as required by *The Sugar Experiment Stations Acts, 1900-41*.

STAFF.

There has been little material alteration in the staffing position during the year under review, and this means that a very considerable proportion of the officers of the division is still absent in the Armed Forces or on special national service duties. One adviser in agriculture, however, was released from the R.A.A.F. and is now back on duty at a field station, an assistant adviser in the Horticulture Branch also returned to civilian duties from the same service, a horticulturist was appointed early in the departmental year for vegetable investigational work in the metropolitan market gardening areas, and an assistant entomologist was recruited for service in the Rockhampton district. A new assistant adviser was appointed for service with the Horticulture Branch in the Stanthorpe district, and a cadet was appointed to the Biloela Experiment Station.

Late in the departmental year the Government Botanist's services were made available—at the request of the High Commissioner for the Western Pacific—in connection with a survey of the forest resources of the British Solomon Islands Protectorate.

EXPERIMENT STATIONS.

In May of this year, approval was obtained for the reopening of the Hermitage as an experiment station primarily intended to serve the requirements of the Darling Downs, and preliminary steps have been taken to implement this approval. It is proposed that the Hermitage function as a regional station, which means that, although administered by the Division of Plant Industry, it will be available also for the conduct of experimental work required by other divisions of the Department. It is obvious that the Hermitage, when reopened, will play an important part in the investigation of the problems of the wheat-growing industry and that it will be the main centre of the departmental wheat-breeding programme. Otherwise the experiment station position remained as in recent years.

ACCOMMODATION.

The only change that has occurred in accommodation at country centres has been the alteration of a room in the court house in order to provide urgently required laboratory facilities for the Assistant Entomologist stationed at Gayndah.

A reallocation of accommodation in the head office building in Brisbane has been agreed on and this reallocation will enable the Administrative and General Branch of the Division, the Agriculture Branch, the Horticulture Branch, and the Bureau of Sugar Experiment Stations to be housed alongside each other on the top floor of the William street building. The Science Branch—other than the Botanical Section which is located in the Botanic Gardens—and the Chemical Laboratory will continue to be located on the basement and sub-basement respectively. The transfer of these two branches of the division so as to place them alongside the other branches is quite impracticable within the confines of the present William street building and, even if space were available on the top floor, the cost of the transfer of the laboratories of these two branches would not be justified, at least under existing conditions.

CROP YIELDS.

Climatic and other conditions prevailing during 1944-45 produced a marked diversity in the yields of many of the crops grown in this State. The wheat crop gave a return of almost six and a-half million bushels, with the highly satisfactory yield of 21 bushels per acre, whereas the maize crop on the Atherton Tableland, which suffered from unfavourably heavy rains at critical periods in its development, will be one of the lowest on record and may be in the vicinity of only

three thousand tons. The total yield of cotton was considerably lower than the average for past years, but some farmers did receive very satisfactory returns from land which was farmed in accordance with departmental recommendations. Severe frosts had a markedly adverse effect on the grape crop in the Stanthorpe district, but the pineapple crop, on the other hand showed a definite upward movement, and vegetables such as tomatoes and pumpkins again yielded most abundant crops with very heavy exports to southern States. Vegetable production continued at an abnormally high level on the Atherton Tableland, in the Mareeba and Dimbulah districts and on the Lower Burdekin, production having been stimulated by the greatly increased consuming capacity of North Queensland. It is felt, however, that the production of green vegetables in the far North will probably decline with a return to normal conditions. The navy bean crop in the South Burnett showed a marked increase in acreage over last year, but it is expected that the yield of the peanut crop in that district will be in the vicinity of last year's total, namely, 10,000 tons. The tobacco crop in the three main producing districts suffered from a number of adverse factors, blue mould being responsible for considerable losses in all three, while leaf miner and stem borer caused appreciable damage at Mareeba and Dimbulah, thrips being similarly destructive in the Texas-Yelarbon-Inglewood tobacco-growing area. The grain sorghum crop on the Darling Downs received a setback as a result of heat wave conditions which prevailed early in November, but quite a number of the later planted crops produced very satisfactory yields.

AGRICULTURAL EXPERIMENTAL WORK.

Agricultural experimental work continued on as extensive a scale as was practicable under the prevailing abnormal conditions which affect both the available manpower and the required facilities for carrying out such work. The plant-breeding programme in wheat, cotton and grain sorghum progressed satisfactorily along the lines laid down in previous years. The very extensive programme of cotton experimental work which has been under way at the Biloela Experiment Station for quite a number of years was also continued, and some small scale work was carried out on the Kairi Experiment Station although it is still occupied by the Army. The various field officers of the Agriculture Branch also carried out varietal, fertilizer and other experimental work in their respective districts in so far as circumstances permitted.

HORTICULTURAL EXPERIMENTAL WORK.

As in the last few years, horticultural experimental work has consisted largely of the investigation of a wide range of problems associated with vegetable production and, in this series of projects, very real progress was made during the year under review. A considerable amount of attention was devoted also to the rather rapidly expanding ginger crop on the North Coast, and field experimental work on this crop was conducted both at Buderim and at Nambour. The long range fertility experiments in citrus and apples at Gayndah and Stanthorpe respectively received adequate attention on the reduced basis adopted during the last two or three years. The papaw breeding work and the pineapple plant selection work at Nambour were continued as in the previous year except that the former was placed on a more ambitious footing by the planting up of a new area of land recently leased for this particular purpose.

PASTURE EXPERIMENTAL WORK.

Once again the investigation of pasture problems was carried out on a greatly reduced scale, this being in conformity with the policy adopted when Japan entered the war late in 1941. Officers of the Agriculture Branch, however, did handle as much of this work as was practicable under existing abnormal conditions. It also received some measure of attention at the Bureau of Tropical Agriculture and at the Biloela Experiment Station.

ENTOMOLOGICAL INVESTIGATIONS.

Quite naturally, the entomological project which received most attention from the general public during the 1944-45 season was the investigation of the new insecticide commonly referred to as D.D.T. Early in the year a Commonwealth-wide scheme for the investigation of the use of this very promising new insecticide in plant industry was launched and was participated in by each State Agriculture Department and by the Commonwealth Council for Scientific and Industrial Research, which acted as the co-ordinating body for the project. The insecticide was tested in Queensland against a wide range of important pests, and a perusal of the report of the Officer-in-charge, Science Branch, will show that, in quite a number of cases, very satisfactory results were obtained. It may thus be assumed that D.D.T. will find an important place in the range of insecticides available to primary producers in

Queensland. One important point in connection with the use of D.D.T. on food crops is the attitude of the various health authorities which, it is understood, is that D.D.T. residues on such products will be considered on the same footing as arsenical and fluorine residues and will be allowed the same degree of tolerance.

PLANT PATHOLOGICAL INVESTIGATIONS.

The scope of plant pathological work was again very much restricted because of the high proportion of officers in this section who are absent in the Armed Forces. Attention was devoted mainly to vegetable disease problems, because of the important part they played in the vegetable production drive necessitated by the greatly increased population in this State. The recently expanded ginger-growing industry also called on the Plant Pathology Section for assistance in solving some of its problems.

WEED PEST PROBLEMS.

The weed pest which received most attention from this Department, during the year under review, was lantana and, in this case, the work was entirely along the lines of biological control. The lantana leaf bug, which is the most important natural enemy of lantana established in Queensland to date, has been present in very large numbers in North Queensland for quite a number of years. It has also been established in central coastal Queensland for about the same period, although there it has not been breeding nearly so freely as in the far North. Comparatively little success, however, had been achieved in numerous attempts to establish the insect in south-eastern Queensland, and during recent summer months one hundred and twenty large colonies of bugs were accordingly collected in the Gympie and Mt. Bauple districts and liberated in areas between Gympie and Coolangatta on the border, and Toowoomba on the edge of the Main Divide. Most of these colonies were personally liberated by departmental officers, and as the time which elapsed between their collection and liberation was much less than when colonies had to be obtained from the far North it is felt that the 1944-45 liberations were made under much more favourable conditions than in earlier years in so far as the country south of Gympie is concerned. The bug is now thoroughly well established in the Gympie district and as it occurs in very considerable numbers along the range below Toowoomba and in at least one centre in the Lockyer it is felt that even in south-eastern Queensland progress has been made in one of the main objectives of the departmental distribution campaign, i.e., to ensure that the bug is available for collection by farmers themselves at a number of centres throughout the State. It is hoped that reports from other centres during the forthcoming summer months will disclose the fact that the bug has been established elsewhere in south-eastern Queensland.

SOILS AND WATERS INVESTIGATIONS.

Several officers of the division were actively engaged on soils investigational work during the year under review, more particularly in the Lockyer and in the market gardening areas supplying the City of Brisbane. In the latter case, nutritional problems, mainly as they affected the production of tomatoes, were the subject of investigation, and results of very definite value to the tomato-grower were obtained. In the case of the Lockyer, the information sought was that which would be of value to the farming community as a whole and the project was so expanded as to obtain data regarding the extent of irrigable land in the Lockyer Valley, this latter information being desired specifically for the use of the Bureau of Investigation. Other officers devoted some considerable time to the testing of irrigation waters and waters for stock-feeding purposes and, in both categories, the very considerably increased amount of attention given to waters was justifiable as a valuable service to the farming and grazing communities, particularly during a period of very low rainfall.

ADVISORY WORK.

All branches of the division again participated very extensively in advisory activities and, in this respect, a great deal of assistance was given to the farming community. This is, of course, one of the most important functions of the Division of Plant Industry but it is one which cannot be written up to any great extent. The work consists of personal interviews with farmers both in head office and in the various districts served by the field stations of the different branches, of correspondence in reply to written enquiries submitted by farmers, and of laboratory examinations carried out in elucidating problems arising out of enquiries made by the farming community. Another very important feature of advisory work is, of course, the series of contributions made by officers of the division to *The Queensland Agricultural Journal*. This journal must, of necessity, be an important link between the departmental officers and the farmers of the State because, in a state of such vast dimensions as Queensland, it is impossible for the field officers to maintain frequent contact with more than a relatively small proportion of the farming community.

PUBLICATIONS.

The publication work of the division is not confined to the series of contributions supplied to *The Queensland Agricultural Journal*. To this has to be added a number of articles based on investigational work carried out within the Department, which appeared in *The Queensland Journal of Agricultural Science*. This journal was established two years ago by the Department as a medium for the publication of the detailed results of its experimental and research work. Popularly worded summaries of the results of such work, of course, are prepared for *The Queensland Agricultural Journal* for the information of the farming community in general.

ROBERT VEITCH,
Director, Division of Plant Industry.

(1) REPORT OF THE DIRECTOR OF AGRICULTURE.

Although the past year could be regarded as a fairly good one from the point of view of production of some of the most important food crops, the early prospects for a particularly good year throughout the whole of the agricultural districts did not materialize. In Southern Queensland, weather conditions during the winter and early spring months were very favourable for crop production, but dry, hot conditions generally prevailed from then until late December and early January. In the Central district, particularly dry conditions prevailed for the greater part of the year and crop production and pastures suffered accordingly. Conditions in the northern part of the State varied from one of the lowest rainfalls ever recorded at Mackay to one of the heaviest on record on the Atherton Tableland.

The effects of the erratic seasonal conditions were reflected, to a greater extent, in grain crops than in any other crop. As a result of the excellent winter rains the wheat crop was considerably above average, but the maize and grain sorghum crops were considerably below average. The shortage of grain for stock feeding was more acute than during any previous year, and considerable hardship was caused. This was greatly accentuated by the unprecedented demand for grain for poultry and stock feeding purposes and the general shortage of grain throughout the Commonwealth, brought about by drought conditions which occurred simultaneously in practically every State.

Experimental work was again reduced to a minimum to permit field officers to devote the greater portion of their time to work associated with District War Agricultural Committees, and especially to the stimulation of increased crop production. The response to the appeals for increased production was again all that could be desired.

WHEAT AND OAT BREEDING.

Wheat.—Breeding plots were established at Kincora, Yaralla, and Roma, and at each centre 189 varieties and selections were sown in observation plots.

Seed increase plots and four new crossbreds, which it is proposed to bring into general cultivation shortly, were established at Oakey and Dalby. The results from all plots were highly satisfactory, and two of the crossbreds were so outstanding that arrangements have been made to sow several acres of each in different districts this season.

Oats.—A total of forty varieties and selections of oats were sown in plots at Kincora and in the Kingaroy district. The variety "Klein" and the crossbreds "Victoria X Richmond" and "Fulghum X Victoria" were again outstanding. Sufficient seed of each of these is now available to establish grazing trials next season.

SORGHUM BREEDING.

This programme was largely hampered during the season by water shortage, soil variability, and severe attacks by sorghum midge and grasshoppers; the losses caused by sorghum midge in breeding plots this year were the most serious yet experienced, and it is essential that some method of control be attempted in future years.

In the main varietal trial at Biloela—which is also discussed in the report of the Specialist Adviser, Experiment Stations, and Cotton Specialist—comprising twelve varieties and strains, Wheatland and Kalo were most successful, with yields exceeding 40 bushels per acre. In a season in which the crop developed almost solely on the moisture available in the soil prior to planting, the later maturing varieties were not seen to advantage; some of the earlier selections produced very well under conditions which should have favoured early maturity, but they do not appear to have the inherent yielding capacity of a variety such as Kalo. Considerable lodging occurred on sections of the plot during the immediate post-maturity period, and useful varietal comparisons in standing ability were obtained.

Pedigree selection coupled with self-fertilization has been continued, with special attention again to grain sorghum. Progress has been made in the isolation of new selections from

variable strains, and purity has been maintained in uniform progenies, such as those from Hegari and Ajax. A new selection from Wheatland, which will be watched with interest, is intermediate between this variety and Kalo in respect of certain of its characteristics.

Hybrid plantings included ten crosses, and comprised one F₁, four F₂s, and 171 F₃s. Selected heads from these crosses have been threshed to provide seed for later generations, and some progress can be recorded towards achieving the aims for which the crosses were made.

Pure seed plots yielded increases of the two varieties, Open Wheatland (for trial in coastal areas, where lepidopterous larvae are serious pests of maturing heads), and Ajax (intended for scrub farms, where Kalo is prone to lodge seriously). In addition, selfed seed of Kalo, Wheatland and Hegari has been obtained for the provision of increase plots of these varieties next season.

In the Kingaroy district seed increase plots of six saccharine varieties and five grain varieties were established in isolated areas. Seed for these plots was selected from the selfing plots which have been established in the Kingaroy district each season for several years past.

COTTON BREEDING.

An extensive programme of cotton improvement was carried out at several centres and, on the whole, very satisfactory results were obtained. It would appear from the results that some of the problems which have been enumerated in the past are now nearing solution. Details of the cotton breeding work are presented elsewhere by the Specialist Adviser, Experiment Stations, and Cotton Specialist, under whose direction the work was conducted.

SEED SELECTION.

Maize.—Unfortunately, shortage of staff made it necessary to again curtail the improvement work with maize and only sufficient seed selection work was carried out to provide seed of the different strains and varieties for more extensive work next season.

Wheat.—The Senior Adviser in Agriculture on the Darling Downs again assisted officers of the State Wheat Board with the selection of crops to be reserved for seed purposes. This scheme has proved highly satisfactory, as it is the only means of assuring growers of supplies of pure seed. All crops which are selected for seed purposes are inspected, during growth, by departmental officers and officers of the Board.

Grain Sorghum.—Field officers, for the past few years, have endeavoured to encourage a number of selected growers in each of the main grain sorghum districts to produce crops for seed purposes, and the results have been highly successful. Crops which have been grown from selected seed are inspected during growth by departmental officers and any roguing which may be necessary is done before the seed heads appear. Substantial supplies of good quality, true-to-type seed of each of the most popular varieties are now available in several districts.

Soy Bean.—Last year an endeavour was made to import from the United States of America, sufficient soy bean seed to sow several hundred acres, but unfortunately it was not possible to obtain large quantities of seed of varieties which were known to be suitable for Queensland conditions. It was ultimately possible to obtain a total of 6 cwt. of seed of 5 varieties. This seed was sown in the Kingaroy district, and although a considerable amount of damage was caused to the ripening crops by continuous wet weather, sufficient seed has been procured from the plots to sow at least 250 acres this coming season. It is hoped that fairly large quantities of seed will be available from these sowings for oil extraction and processing for stock food to determine whether the crop can be grown economically in this State for processing purposes. The department has experimented with some hundreds of varieties during the past twenty years, and it is now not a case of determining whether soy beans can be grown in Queensland, but whether they can be produced economically on a commercial scale.

Tobacco.—Pure seed selection plots of tobacco were established in the Central District and ample supplies of seed of the varieties most in demand were selected for distribution to growers. It has been decided to suspend, for the time being, distribution of seed of the variety "Kelly" as complaints have been made in the course of the past two seasons about the great variation in type. This is evidently due to the fact that the variety is a comparatively new one and is still segregating and until such time as a type has been fixed the variety will remain out of general cultivation.

EXPERIMENTAL.

Oats.—Varietal trials were established on the Darling Downs, Lockyer, and the South Burnett districts.

Potatoes.—Varietal, fertilizer, and seed spacing trials were conducted at Ayr and Home Hill. A potato storage trial was also conducted in the latter district.

Navy Beans.—Varietal and spacing trials were conducted in the Kingaroy and Maryvale districts.

Soy Beans.—Varietal and observation trials were laid down at Atherton, Westbrook and Kingaroy.

Tobacco.—Soil improvement and nematode control trials which have been conducted in the Mareeba district for some years past were continued.

Linseed.—Trials with ten varieties of grain types were continued on the Downs and sufficient seed is now available for yield trials during the next season on a field scale.

Legumes.—Observation plots of native and introduced grazing and green manure legumes were continued in the Central district, and also in several different districts in Southern Queensland.

CROP PRODUCTION.

Wheat.—Weather conditions were very favourable for both the early and late sown crops in the main wheatgrowing areas, and the crop was sown under excellent conditions. Throughout the whole growing period weather conditions continued favourable and at no stage was there any check in growth. Crops in all districts made excellent growth and were particularly free from rust. Yields from all varieties were above average, and it is interesting to record that one of the recently released new varieties, Pusa X Novo, which was bred by the departmental wheat breeder, yielded in the vicinity of 48 bushels per acre of excellent milling quality grain. During the harvesting period, weather conditions were ideal, and it was generally agreed that no wheat crop had previously been harvested under more favourable conditions. The quality of the grain was excellent, over 90 per cent. being classified as Q1, the balance being classified as Q2.

The total acreage sown was in excess of 300,000 acres with an average yield of 21 bushels per acre. Of the 37 varieties sown the first 10 occupied 87.6 per cent. of the total area, and of these 8 Queensland-bred varieties accounted for 80 per cent. of the total area sown.

Maize.—The maize crop, harvesting of which has not yet been completed, will probably be one of the lowest for very many years. Dry conditions prevailed in practically all maize areas throughout the spring months and the early and mid-season crops were seriously affected, so much so that a large percentage of the crops was used for green feed for dairy stock. Weather conditions were more favourable for the late crop in Southern Queensland, and in some districts from fair to average yields were obtained. On the Atherton Tableland, maizegrowers experienced one of the worst seasons on record. The general sowing took place during December and the acreage sown compared favourably with previous years. Crops made good progress until mid-January, when heavy and continuous rains occurred; those had a very adverse effect on the crop. For the months of January, February, and March the registration at Atherton aggregated 64.35 inches. The wet conditions continued until May and as a consequence crops not only were considerably below average in yield, but also in quality as the percentage of diseased grain was very high.

Grain Sorghum.—As was the case with the maize crop in Southern Queensland, the grain sorghum crop suffered severely from the dry conditions which prevailed prior to the New Year, and the early anticipation that production would continue to expand at the same rapid rate as during the two previous seasons was not realised. Many of the earlier sowings were either fed off or ploughed out after the heat wave in November. Better results were obtained from late sown crops, yields up to 75 bushels per acre being obtained in some localities. The total yield, however, will be considerably below that of the previous year.

Potatoes.—The response to the appeal which was again made to Queensland potato-growers to make every effort to meet the heavy requirements of Australian and Allied fighting forces, in addition to the normal civil requirements, was again very good, especially in the Mackay, Ayr, and Home Hill districts where production has increased from a few hundred tons per annum, prior to the entry of Japan into the war, to an estimated yield of approximately 8,000 tons for the present crop. Total production for the State was 33,644 tons, which was an increase of approximately 10 per cent. on the yield for the previous year. Even this production is still much below the ordinary civilian requirement for the State.

Some losses were caused by dry conditions and later by damage by potato tuber moth in the early crop, but generally, conditions were fairly satisfactory in Southern Queensland districts. In the North, conditions on the whole were good, and very little loss occurred as a result of disease or insect pests. Yields of up to 9 and 10 tons per acre were obtained from irrigated crops.

General satisfaction was expressed by growers in all districts at the improvement in the quality of the seed which was introduced from Southern States, and it was particularly gratifying that greater quantities of certified seed were available. As seed for the spring crop is not available in Queensland, it is necessary each year to introduce seed

from Southern States for this crop, and much of the seed in the past has been of very inferior quality and is largely the cause of the low yields which are frequently obtained. The limited quantity of certified seed which is available each season is eagerly bought at prices considerably in excess of those charged for non-certified seed.

As the length of time the locally-grown potatoes can be safely stored will determine very largely the extent to which the industry can be maintained in the North in future years, storage trials were conducted last season to ascertain the length of time potatoes can be kept in good condition during the warm months of the year. It has frequently been stated that potatoes grown in North Queensland cannot be stored other than for very short periods, but it has yet to be determined whether this is in accordance with fact. It is considered that potatoes can be stored for fairly considerable periods if the tubers to be stored are not over watered towards the end of the growing period, are properly mature before being dug, and are kept free from damage by the potato tuber moth. Results from last season's storage trial appear to confirm this, as a consignment of 20 tons of ordinary commercial potatoes which had been treated with magnesite dust as a protection against moth was stored for a period of 11 weeks from October onwards with a loss of less than 10 per cent. The trials are being continued this year on a very large scale in association with the Deputy Potato Controller.

In practically all districts there has been a considerable increase in the number of mechanical diggers which have been operating.

Cotton.—Although the season, as a whole, was not conducive to the production of high yields of cotton in most districts, the returns obtained from the earlier-planted crops which were grown on ploughed new cultivations, and which were properly cultivated, once again demonstrated that cotton should be included in the rotations practised on dairy farms in districts which are suitable for cotton production. It is becoming increasingly clear, however, that such rotations should provide for late-summer ploughing for cotton so as to conserve the fullest possible subsoil moisture resulting from the wet season and also to obtain good penetration of all autumn and winter rainfall. Where cotton was grown under such conditions this season exceptionally good yields were produced, considering the amount and distribution of rainfall experienced.

Of the total amount of raw cotton produced this season Miller again proved to be the leading variety. This variety produces large, well opened, easily picked bolls containing fibre of good character and strength that is suitable for a wide range of the requirements of the Australian cotton spinners. As Miller yields well under a wide range of soil conditions it is deservedly the most popular variety. New Mexico Acala, which is grown chiefly on the alluvial loams in the Central District, was second in production, with Lone Star and Triumph being equal in third place. These varieties, however, were on an appreciably lower basis than New Mexico Acala because of their being grown in the districts where a serious reduction in acreage occurred.

Peanuts.—Dry conditions delayed planting until December, when approximately 18,500 acres were planted under favourable weather conditions. Conditions remained favourable until the end of February, when the prospects for heavy yields were particularly bright. Dry conditions during March, however, seriously checked the development of many crops and resulted in a general reduction of yields. Ample labour is available for the harvest which, when completed, will yield approximately 10,000 tons.

Practically the entire area of the Virginia Bunch variety was sown with strains of seed which have been evolved by a local departmental field officer, and it is anticipated that at least 80 per cent. of the area under Red Spanish next season will be sown with departmental strains. Growers are unanimous in their appreciation of the work which has been done in this regard, and which has resulted in an all-round increase in yield.

Canning Beans.—The area sown to canning beans again showed a substantial increase. Weather conditions generally were satisfactory and crops in all districts developed good crops of beans and some excellent yields were recorded. In some instances up to 24 bushels per acre were obtained. Unfortunately, dull weather set in before harvesting was completed and some very heavy losses occurred as a result of the beans sprouting or becoming mouldy before the weather again was suitable to continue harvesting.

Tobacco.—The area planted to tobacco in all districts showed a substantial decrease and this applied particularly to the Dimbulah and Mareeba districts, where the area was only a little better than half the normal acreage. Labour shortage, for the production of the crop, and the uncertainty of being able to secure experienced labour for harvesting, was responsible to a considerable degree for the reduced acreage. There is no doubt that the previously unheard of prices, which were being obtained for vegetables in the Far North, attracted

many tobacco-growers to vegetable production. Some loss from blue mould in the field occurred in the Far North and also in the South-West. The total yield will be below that of last season, which was the lowest yield for many years past.

BUREAU OF TROPICAL AGRICULTURE.

During the year the activities of the Bureau were confined chiefly to the preparation of areas for pasture experiments, the introduction of pasture and legume species, the continuation of the Hevea and *Cryptostegia* experiments and the propagation of various tropical crops. The season was an exceptionally wet one, rain falling almost continuously from January to June for a total registration of 187.6 inches.

Rubber.—Harvesting of the Hevea ratoon continued throughout the year, and with the next harvest the experiment will be brought to a conclusion. As each section was harvested the stumps were removed and the area ploughed. *Cryptostegia*, another latex-bearing plant, has been treated in a similar manner and has been subjected to four-monthly cuttings. The experiment will terminate towards the end of the year.

Derris.—The work with derris has continued and several samples have been taken and forwarded for analysis. The above ground growth has been planted in sand beds awaiting the results of the chemical composition. Only material from high-yielding plants will be maintained for propagation purposes.

Sweet Potatoes.—Twenty-two varieties, including a number recently introduced from the United States of America, are now well established. Later in the year, larger blocks of each will be planted to provide planting material for distribution.

Legumes.—Four varieties of recently introduced Mauritius and Velvet beans were sown in observation plots. These show particular promise as green manure crops. Work was continued with the grazing legumes which have been under trial for some years and material is being collected for sowing blocks for grazing trials which are to be conducted in the near future. An area of land has been reserved and planted with small plots of numerous grasses and pasture legumes for the benefit of visitors who are interested in pastures. An additional area of 10 acres has been selected at Utechee Creek, and as soon as labour is available this will be felled and sown with grasses and legumes for experimental grazing.

STAFF.

During the year the Department suffered the loss of a highly-valued field officer by the death of Mr. S. M. Smith, Instructor in Agriculture. Mr. Smith was a very industrious and trustworthy officer and his loss will be keenly felt.

C. J. McKEON,

Director of Agriculture.

(2) REPORT OF THE DIRECTOR OF HORTICULTURE.

Activities of officers engaged in fruit and vegetable work have been continued throughout the year on much the same lines as were described in connection with the previous year's work. Towards the end of the term, co-ordination of the efforts of the two groups of officers was effected, but the results of this will probably be more apparent next year than can be reported at this stage. From the short experience gained during the period under review, it is evident, however, that the co-ordination of all activities on horticultural crops will enable more comprehensive programmes of research and extension activities to be undertaken.

VEGETABLES.

A considerable amount of attention has been paid to the investigation of vegetable problems, particularly in tomatoes and beans. This work has been carried on in the market garden areas in the vicinity of Brisbane, the Stanthorpe district and the near north coast. In the two latter areas, the dry spring and summer following an exceptionally cold winter adversely affected a good deal of the work, but in the Brisbane area where irrigation was available, considerable progress was made. Investigation—continued from last year—on the nutrition of the tomato, was advanced a further stage, and the results will be published early in the new departmental year.

The most important problem on which information was gained was in connection with the use of various forms of nitrogenous manures, and it was found that an essential point to be observed is that the time of application is of the utmost importance; thus, where the nitrogen is used in the form of blood, the fertilizer must be placed in the ground either early, so as to allow for decomposition, or at considerable distance from the plants, so that decomposition will have proceeded to a considerable extent before the tender roots make contact

with it. On the other hand, with sulphate of ammonia applications can be made much later, and this material, therefore, is to be recommended for top dressings on growing plants.

Trials of a large number of different varieties of tomatoes were carried on in the Stanthorpe area, and whilst no one outstanding variety has been found, the plots have served a very useful purpose in that from the fruits produced it has been practicable to make selections of seed, for improvement of types and for future testing work.

Investigations have also been carried on in connection with the non-setting of tomatoes at certain periods, which results in very light supplies on the Brisbane market in the early spring months. A great deal of evidence has been accumulated, which suggests that basically the problem is one of pollination, and at most can be only partially overcome by attention to nutrition. As a result of study of pollination conditions, an instrument has been devised which enables rapid pollination and hybridization. It is felt that this will be most useful in the further studies of this important problem.

Unprecedented frosts destroyed the bean fertilizer trial plots on the north coast, and this work was, therefore, repeated late in the autumn, but picking has not yet been completed and results are consequently not available. Indications are that the information sought will be obtained. Some 12 varieties of beans were tested in the Stanthorpe district, but under the dry conditions no other variety was found to equal the Brown Beauty in either yield or quality of bean.

In the winter and early spring of last year very considerable losses occurred in the lettuce crop in all the major producing districts in the vicinity of Brisbane. The cause of the trouble was obscure, and accordingly a series of experimental plots was laid down at Runcorn, Manly, and Sunnybank. As the symptoms suggested the possibility of malnutrition, the first trials included tests of both major plant foods and trace elements.

Throughout the year, production of vegetables generally was heavy, but there were very few cases of loss to growers on consignments of reasonable quality lots. Tomato production has been noteworthy, with the greatest increases in the Bowen and North Queensland areas. There is a tendency for Bowen growers to ship tomatoes over a longer period than in former years, and if this should continue it is feared that there may be unwelcome repercussions.

Packing of vegetables, particularly tomatoes, is not always satisfactory, and the position calls for a good deal of attention by interested parties.

DECIDUOUS FRUITS.

Further experimental work on fruit-tree nutrition in the Stanthorpe districts suggests that, although trace element deficiencies occur and are of importance, the basic trouble is very commonly lack of available nitrogen. The solution of the problem, however, is not simply the addition of nitrogenous manures to the soil, but is bound up with questions of soil management—including correction of erosion, control of leaching, and addition of organic matter to the soil. All these questions are now being investigated. Lack of seed supplies of cover crops has hampered the work to some extent.

Last season crops of deciduous fruits were light. This followed partly as a consequence of the abnormally heavy cropping of the previous year and partly through losses due to an unusually high population of insect pests, which, in turn, was a consequence of the previous heavy crop.

GRAPES.

The work on hen and chickens trouble was advanced sufficiently far to enable results of experiments and recommendations to be published for the information of growers. Whilst some questions remain to be answered, it is felt that, by the use of borax, growers can overcome this major disorder of some of the leading varieties.

The grape crop, too, was light, following a disastrous late frost which destroyed a very high proportion of the early setting fruit.

BANANAS.

It has not been practicable to embark on any horticultural investigations on bananas during the war period. During the late summer and autumn conditions were abnormally favourable for bunchy top, and a number of serious, though localised, outbreaks occurred. In each case drastic measures were applied and the trouble was brought under control. Shortage of staff has been a contributing factor, but there is reason to expect that the position will be more satisfactory before the seasonal conditions again favour the spread of the disease.

There are approximately 150 more growers now in the industry than last year, and the acreage has increased by approximately 1,000, to 10,300, of which 7,600 are in bearing.

The increase has taken place both in north and south Queensland.

PINEAPPLES.

Field investigational work on pineapples was confined to two lines. The first of these was the testing of alternative fertilizers, dictated by shortages of material. Indications to date are that the 10-6-10 mixture is superior to either the 8-6-10 or 8-6-16. The second line was concerned with the condition known as "crook neck." From the results to date, it is considered better to apply copper and zinc to all pineapples growing in areas likely to produce the disorder than to wait until symptoms actually appear.

An experiment conducted in the Mary Valley, in which comparison was made between nitrate of soda and sulphate of ammonia, indicated very strongly that the former material was not a suitable medium for conveying nitrogen to pineapples on the highly acid soil. The immediate effect of the nitrate was the development of iron chlorosis; sulphate of ammonia on the other hand appears to act as a carrier for iron.

There has been a considerable amount of planting, both by new-growers and an extension of existing areas. The worst feature of this has been that following frost damage, good class planting material has been scarce and consequently inferior material has been used in many cases. This is apt to have serious ill-effects on both the size and quality of the crops.

CITRUS.

The nutritional study commenced at Gayndah in 1940 has been carried on, but so far no differences have been recorded. This year the crop was harvested and virtually all trees yielded heavily.

Crops on the whole have been only moderate in size, both in northern and southern parts, and slightly lighter in the Rockhampton area. Intending growers are encountering much difficulty in obtaining trees. This is due largely to manpower shortages in nurseries. This is clearly shown by the A grade budwood selected by Branch officers for nurserymen. In 1939-40 the number selected was 64,500, whilst last year only 35,300 were required.

PAPAWS.

The papaw breeding work has been carried on; towards the end of the period under review, 2 acres of trees were established at Nambour for progeny trials. Some very fine types have been obtained which, if previous experience is repeated, should be of considerable value to growers. In the far north, war conditions have hampered papaw work to such an extent that it has been possible only to save as much as practicable of the best material.

SOIL MOISTURE AND IRRIGATION INVESTIGATIONS.

That portion of the investigations which were concerned with irrigation of vegetables in the central Burnett has been completed and it is expected that results will be published in the near future. Apart from the direct value of the information on frequency of watering, which was given to vegetable-growers, the data obtained will be used in further work on citrus in this area.

Another phase of the work was concerned with usage of water on vegetable crops in the Sunnybank area. Here, where water is cheap, there is a tendency for growers to over-water to the detriment of crops.

WEEDICIDES IN VEGETABLE GROWING.

The work on chemical weeding of onion crops, foreshadowed in last year's report, was proceeded with in the Lockyer district, where the bulk of the onion crop is grown. The material tested was a trade preparation of sodium dinitro-ortho-cresylate. Experiments carried out on late plantings in 1944 and on early plantings in 1945 showed that the weedicide had potentialities for weed destruction in onion crops. The margin of safety is, however, too slight to warrant unqualified recommendation of the weedicide, but it is considered that its use, under supervision, will prove worthwhile in circumstances where hand weeding is impracticable.

PINEAPPLE COLD STORAGE.

Advantage was taken of facilities offered during March and April to conduct—in co-operation with the Pineapple Sectional Group Committee—a preliminary investigation into certain aspects of cold storage of pineapples. Valuable data were obtained which it is hoped will form a basis for future work. The preliminary tests indicate that the optimum temperature for storage of fresh pineapples lies between 45 deg. and 50 deg. Fahr. It is apparent that many factors have to be considered, particularly the stage of maturity of the fruit and the length of time which elapses between picking and arrival at cold store. Internal breakdown of the fruit is apt to be very serious and, with present knowledge, it would appear that two or three weeks is the longest period over which the fruit can be held by the means now available.

FRUIT AND VEGETABLE EXPORTS.

Production figures for the State are reflected in the quantities exported and the following data show what the position has been, as compared with last year:—

Exports to Southern States.

Crop.	1943-44.	1944-45.
Pineapples	486,043 cases	672,257 cases
Bananas	37,283 "	41,791 "
Citrus	32,860 "	10,087 "
Fruit (Miscellaneous)	174,550 "	195,475 "
Tomatoes	484,507 "	715,559 "
Vegetables (Miscellaneous)	138,903 bags	211,256 bags
Potatoes	23,406 "	64,935 "
Pumpkins	214,000 "	1,185,998 "
Cucumbers	60,863 cases	87,107 cases

Attention may be drawn to the fivefold increase in the export of pumpkins, and also to the increasing importance of tomatoes. Pineapple production showed an increase of nearly 300,000 cases over the rather low figure for last year.

Imports from southern States were, on the whole, also higher than last year, the principal figures being as follows:—

Imports from Southern States.

Crop.	1943-44.	1944-45.
Fruit (Miscellaneous)	1,341,369 cases	1,729,249 cases
Vegetables (Miscellaneous)	112,597 bags	92,632 bags
Potatoes	565,356 "	768,330 "
Onions	134,076 "	132,207 "

The bulk of the miscellaneous fruits are, of course, apples, pears and other temperate climate species, whilst the vegetables represent off-season requirements.

W. A. T. SUMMERVILLE,
Director of Horticulture.

(3) REPORT OF THE SPECIALIST ADVISER, EXPERIMENT STATIONS, AND COTTON SPECIALIST.

Although climatic conditions were not generally conducive to the production of good yields of cotton, the results obtained in breeding blocks and strain multiplication plots—work which was conducted in co-operation with officers of the Agriculture Branch—at various centres indicated, as a whole, that improvement in several directions is being achieved in the programme of cotton-breeding conducted by this department in the Miller, Lone Star, New Mexico Acala, Triumph, Qualla, and Rowden varieties. Likewise substantial progress was made in the programme of investigations conducted at the Biloela Regional Experiment Station. The more outstanding features of the operations relating to cotton improvement are presented under the heading of cotton-breeding, while the investigations—other than in cotton-breeding—conducted at the experiment station are summarized under the heading of Biloela Regional Experiment Station.

COTTON-BREEDING.

The improvement work in Miller is centred at the Biloela Regional Experiment Station in the Callide Valley—the district in which the greatest acreage of this variety is grown. The breeding programme embraces two phases. One phase relates to evolving out of the present commercial stocks a strain with a more open habit of growth, a higher lint percentage and increased drought resistance than the present types, but which is not necessarily jassid-resistant, for general use where this variety is required other than in jassid-infested areas. The other phase consists of evolving strains that are satisfactory agronomically and that are also jassid-resistant, for use where jassid resistance is of paramount importance. This aspect of the work is being undertaken by selecting and testing apparently jassid-resistant types obtained in fields of the main commercial stocks growing in jassid-infested areas, and by a programme of hybridization between Miller and cottons that are jassid-resistant but are not otherwise suitable for Queensland conditions.

Dealing with phase one, progress was made in multiplying the seed increase obtained in the 1943-44 season, of a mass selection out of Lot 41S—the leading commercial stock of Miller. In a strain trial this mass selection—which is now known as Lot 42—compared very closely to its parent in regard to length, strength, density and drag of the fibres. As it is more uniform in general characters it will accordingly be further multiplied for replacement of Lot 41S. Very encouraging results were obtained in the main progeny block of Miller grown with a farmer co-operator, which indicated that there was a high degree of correlation between the performances of parent plants and subsequent progenies. As this particularly applied to ginning percentages it would appear that it will be possible

to improve Miller in this important respect and at the same time retain other desirable characters now present in the variety. The outstanding strain of this progeny block—for both agronomic and lint characters—was also the most impressive in the group of progenies grown in another section of the district last season. A small increase plot of it this season yielded cotton with a 38.4 lint percentage, compared with approximately 35 for the commercial stocks. The strain will accordingly be multiplied in the coming season for further more extensive testing. A considerable number of re-selections taken from the increase plot for testing next season showed even higher lint percentages, so it is possible that further improvement may be possible in this respect.

Very promising results were also obtained in the second phase of the improvement work in Miller, i.e., the evolving of resistant types suitable for jassid-infested areas. Under the very dry conditions only a light jassid population was present in the rain-grown trials and breeding plots, so that a severe test for resistance to this pest was not possible. The conditions provided an excellent opportunity, however, to test the respective merits otherwise of the more advanced strains of Miller and hybrids between Miller and U4 developed for jassid resistance. The two high yielding hybrids mentioned in last season's annual report were released for commercial testing under the lot numbers Umil 11 and 12. Both yielded reasonably well under dry conditions, while the latter in a mid-November planting at the experiment station outyielded all other varieties when grown with supplementary irrigation. Unfortunately its ginning percentage was somewhat low under the dry conditions of this season. Re-selections with lint percentages up to 40 have been obtained from it this season, however, so no further multiplication of the Umil 12 will be released until the best of these new strains are available. The highly resistant Miller strain III-26-0 was released for commercial distribution as Lot 1. It showed considerable drought resistance—producing over 500 lb. seed cotton per acre—and had a lint percentage of 36.8 for the commercially ginned crop. Five thousand pounds of seed of this strain will be available for distribution in jassid infested areas in the coming season. Further re-selections from it showed a decided improvement in length—a character in which Lot 1 is somewhat deficient, being only a 15/16 inch cotton. Very promising re-selections from other Miller jassid-resistant strains were also obtained.

Advantage was taken of the fact that heavily irrigated, late-planted cotton develops a rank growing plant that usually experiences a severe attack of jassids, to carry out a comprehensive testing of a range of the more advanced hybrids and strains of Miller and a commercial stock of this variety—41S—for jassid resistance. By the end of the season a heavy attack of jassid had occurred on 41S and one or two of the new strains, but most of the latter were relatively free from attack—one yielding at the rate of 1,220 lb. seed cotton per acre—compared to 722 lb. for 41S.

A further step in the work of imparting jassid resistance to the very susceptible Triumph, New Mexico, and Lone Star varieties, was carried out by back-crossing hybrids of each one made last year, with the recurrent parents.

Improvement work in the New Mexico Acala variety was possible this season with only one farmer co-operator in the Upper Burnett. Only moderately satisfactory results were obtained, the progeny area having to be placed on soil somewhat too fertile for the variety. One promising progeny of an open habit of growth and a good number of re-selections were retained for further testing.

Activities in the Lone Star variety were confined to multiplication of some of the most promising newer strains in sections of the Central Burnett district. Sufficient seed was produced to allow of comprehensive testing of these strains during the coming season. Lot 25—the new strain which had yielded well in the three previous seasons—performed satisfactorily, and sufficient seed will be available to plant approximately 800 acres in the coming crop.

Good progress was accomplished in the programme designed to improve the Triumph variety—the work being conducted in the Upper Burnett, in the lower Central Burnett, and in the Marburg section of the West Moreton district, where this variety gives promise of being the most satisfactory cotton for the alluvial soils and the lower fertile slopes. A very open type—strain OS. 39-4—again yielded well on the fertile alluvials of the Upper Burnett and 165 new selections and several progenies were retained for further testing. The dry conditions very adversely affected the fibre length and strength of OG. 39-10—another quick-fruited strain which had yielded well in the Central Burnett in previous seasons. It was therefore decided to eliminate this strain and concentrate on OG. 39-7—which produced longer and stronger fibre and gives promise of being a very suitable cotton for growing on the alluvial soils of the Central Burnett district both with and without supplementary irrigation. A large number of re-selections was taken in the latter for an intensification of the work of obtaining a highly suitable strain for alluvial soils in this and adjacent districts when conditions are not

suitable for OS 39-4. The very good yields of high quality obtained with a more robust growing type of Triumph—OS. 39-1—would appear to indicate that it is a suitable strain for the lower fertile slopes in the Central Burnett, where most other more vigorous varieties tend to grow too rankly when planted later than November. A large number of new selections was made in a field of it in this district which yielded over 1,200 lb. seed cotton per acre, for further testing under rain grown conditions in this area. One progeny increase of a selection originally out of OS. 39-1, which has reached the multiplication stage for field trials, yielded over 1,200 lb. seed cotton per acre at the breeding centre of this strain located on a forest slope in the Marburg district where this type of Triumph has been grown for some years. A good number of re-selections was taken from several very promising sub-strains of OS. 39-2—a robust strain of Triumph which was favourably commented on in last year's annual report of cotton-breeding operations. Altogether, the work in the four main strains of Triumph gives promise of supplying some very satisfactory cottons for a range of soil and climatic conditions where a quick fruiting variety of this type is required.

The breeding work which has been conducted in the Qualla variety for several years has evolved several strains highly suitable for growing on either infertile shallow sandy soils or where a high degree of drought resistance is required for soils of moderate fertility in the drier districts. The cotton produced under dry conditions by all of these strains is of satisfactory quality.

The results of trials of Rowden—a relatively new variety—conducted at Biloela and in several centres in the West Moreton District, during the last three seasons have been most promising. The variety appears to be suitable for the moderately fertile slopes where Miller and New Mexico grow too rankly in a wet season, yet all strains of the quick fruiting Triumph react to very dry conditions. The bolls are larger than Triumph and the fibre is an inch long and of good hard body and character. A mass selection of superior plants made in the 1943-44 crops was multiplied this season prior to starting more intensive development of strains suitable for various conditions where a variety of this type is required. An extensive testing of the main parent stock will be carried out in the major cotton growing districts during the coming season.

BILOELA REGIONAL EXPERIMENT STATION.

The climatic conditions experienced at this centre throughout the season under review were unfavourable for the production of non-irrigated crops. A planting rain did not occur in the spring until late October and was followed by a heavy beating hail storm at mid-November—the first general one in the history of the station. This storm which, at one 15-minute period, fell at the rate of 5.70 inches an hour, packed all cultivations to plough depth so badly that their permeability was impaired for the rest of the season. Other scattered light storms received during the rest of November were followed by below normal rainfall in December, which consisted of several short beating storms that mostly ran off the packed ploughed soils of even very slight slopes although the latter's surface had been well cultivated. The rainfall in January, while slightly above normal, consisted mainly of two heavy storms at mid-month. February rainfall was much below normal and occurred in the form of scattered light showers that were of little crop value. March, April, and May were very dry—but the June rainfall was slightly above normal.

A total of 23.11 inches of rainfall was received for the 12 months ending the 30th June, compared to a mean of 27.95 inches for the 22-year life of the station. Forty-eight per cent. of this rain fell at the rate of .7 inches or more per hour and mostly failed to penetrate the hard packed soils to a satisfactory depth. All rain-grown crops were thus dependent on receiving additional moisture at frequent intervals, and therefore reacted severely to prolonged dry spells.

A comprehensive programme of investigations was carried out during the season, which yielded some very interesting information that will contribute to the eventual solution of the problems being studied. Altogether 227 acres of cultivations and fallows were embraced in the operations pertaining to cotton, grain sorghum, wheat, cowpeas, and Rhodes grass. The following brief summaries present the most outstanding features of the investigations conducted in each crop.

COTTON.

About thirty acres—half of the area of cotton investigations—was planted by the end of October but the mid-November hail storm destroyed most plantings including the irrigation experiments. Consequently the investigations were conducted in cotton planted in late November, which previous results have indicated is fully a month past the most desirable date for obtaining the best yields in the Callide Valley. A rather sappy vegetative type of plant resulted from the combination of late planting and shallow penetrating rainfall.

Consequently plant growth reacted severely during hot dry periods although in all treatments which provided an increase of moisture the plants withstood the stress conditions longer and consequently produced gains over normal procedures.

Past investigations at the experiment station have shown that growing cotton in rotation with grassland markedly improves the chances of producing satisfactory yields of both rain-grown cotton and grass under a wide range of soil and seasonal conditions. There are several aspects of this rotation which need clarification, however, and much of this season's investigational programme accordingly centred around them. Agreement was obtained with many previous findings that cotton following grassland generally outyields cotton following old cultivations on which annually planted crops have been grown. Likewise, ploughing Rhodes grass in March at the end of the wet season again conserved a greater depth of subsoil moisture than did June or August ploughings. This additional moisture enabled the cotton plants to withstand the early stages of the prolonged stress conditions in February and resulted in increased yields being obtained on the March ploughed plots. The validity of previous ideas was confirmed that it is necessary to grow Rhodes grass for at least three years on old cultivations to restore soil conditions that are favourable for producing satisfactory yields in the following two or three crops of cotton.

Confirmation of the value of an ample supply of subsoil moisture at planting time was obtained in an experiment in which cotton following an autumn-grown crop of potatoes appreciably outyielded cotton grown after either cotton or grain sorghum. Very heavy rainfall was experienced in the previous February prior to planting the potatoes, and soil moisture investigations indicated that the potatoes utilized only the upper layers of the resultant subsoil moisture. When cotton was planted this past spring the plots following potatoes, grain sorghum, and cotton were wet respectively to depths of 6, 2, and 1½ feet, the difference between grain sorghum and cotton being due to the earlier harvesting of the former allowing of better conservation of the early winter rainfall.

The value of ample moisture during the growth of a cotton crop was well illustrated by the results obtained with supplementary irrigation. In a varietal trial embracing five varieties, which was replanted on the 24th November, after the original planting had been destroyed by the hail storm, yields ranging from 1,317 to 1,665 lb. seed cotton per acre were obtained with four spray irrigations totalling 8.2 acre inches, after planting. Prior to the original planting, an irrigation of 3 acre inches was given which, combined with the end of October rainfall, wet the soil to 2 feet. In an experiment planted 4th December on 5-year old fertile cultivation previously under cotton, irrigated cotton yielded 1,200 lb. seed cotton per acre compared to 437 lb. for rain-grown cotton—a total of 7.9 inches of spray irrigation being applied in three waterings after planting plus a pre-planting irrigation of 3 inches.

SORGHUM.

A total of 14 acres of sorghum was grown, of which 8.5 acres were devoted to operations relating to breeding activities, varietal, and strain trials and pure seed increase plots under the personal direction of the plant breeder responsible for sorghum breeding. This work is also referred to in the report of the Director of Agriculture.

The main progeny block contained some 170 rows originating from individual heads of plants selected for some special character or characters, and embraced a range of types from Kalo, Wheatland, Day Milo, Hegari, Ajax, Schrock, Red Kafir, various sweet sorghums and white grain varieties, and several advanced hybrids. An excellent range of material resulted, but midge attack was especially bad in this block of mixed ages of maturity and caused nearly a 100 per cent. loss of grain. It was evident, however, that progress had been made in several directions by individual plant selection and further investigations will be continued in this material. One progeny in Wheatland which appeared very uniform was particularly impressive. It was possible to reduce some of the work within this variety—the progenies with semi-open heads being discarded on account of their inferior performance compared to both the open-headed and the normal headed progenies of it.

A large range of hybrids of different generations was grown which yielded some promising material. The plants in the F. 1 generation of a cross between the short and stockier stalk type—Double Dwarf Kalo—and the standard Kalo, were of the Kalo type with very large heavy heads. Ample selfed seed was obtained to plant the F. 2 generation and the resulting types will be studied with interest, for any improvement in resistance to lodging obtained in the otherwise suitable standard Kalo type would increase the range of usefulness of this variety in the Callide Valley. Some 75 individual selections in various F. 2 generation crosses between a range of types were selfed for further study in the F. 3 generation. A group of 171 of the F. 3 generation from five of the Shallow crosses mentioned in the last annual report made sufficient growth to show up differences in plant type. A small number of rows contained plants combining short

stature with a very open head—one or two progenies being surprisingly uniform in this respect. It was possible to obtain seed of some of these types, which supplemented with the residual F. 2 seed, will enable this work to be continued.

The main varietal trial embraced varieties that have performed the most promisingly at this centre in previous seasons. Although planted later than usual for the main commercial crops of the district, surprisingly good results were produced by the four leading varieties—yields ranging from 39 to 46 bushels per acre. The mid-season standard varieties Wheatland and Kalo led with respectively 46 and 44 bushels. Under the conditions of dry late summer and autumn, the normally later maturing varieties produced significantly less grain—Schrock being outstandingly last. Open Wheatland again indicated that it does not yield as well as the standard type of this variety in a dry season in the Callide Valley—its main promise of usefulness therefore appears to be in the coastal districts, where it proved to be superior to normal Wheatland in an exploratory trial this year.

Further progress was made in the pollen grain anthesis study which has been conducted during the past two seasons. The observations made satisfactorily substantiate those recorded in past seasons. Additional varieties were studied and the sorghum breeder reports that the investigation has reached the stage where it can be summarized for publication.

WHEAT.

The usual practice of sowing an area of wheat for hay was carried out at the end of May, 1944. The combination of good subsoil moisture resulting from the previous February rains and above normal rainfall in July after planting, enabled the resultant crop to make splendid progress through the dry spring. A yield of approximately 3 tons of hay of excellent quality was produced with the Warput variety. In June, 1945, a range of some 180 varieties of wheat supplied by the departmental wheat breeder were planted for rust resistance studies.

COWPEAS.

No investigations were conducted in cowpeas but 13.6 acres of the Black variety were sown at mid-November for green manuring purposes on the lighter soils prior to planting winter cereal crops for hay. By late January an excellent growth, which was estimated at 7.9 tons green material, had been produced. This was ploughed under and had decomposed satisfactorily by wheat-planting time in June.

A total of 61.5 acres of Rhodes grass was grown and once more this grass has demonstrated its usefulness on the forest alluvial soils of this district. At mid-February when native pastures, long established stands of Rhodes grass on scrub soils, and new plantings of sorghum and sudan grass were all withering for lack of rain, the areas of Rhodes grass throughout the valley that were in the second or third season after cotton, were green and highly palatable to stock. The following yields of dry hay obtained at the experiment station during the first flush of growth in the summer portray the value of this grass and also the need for planting it as a crop in rotation with cotton:—2nd year 1.92 tons, 3rd year 1.53 tons, and older areas estimated at .75 tons.

It has been found at the experiment station, that if Rhodes grass is withheld from grazing after being either cut for hay or closely grazed around mid-season, that in most seasons the resultant regrowth makes sufficient height to provide a canopy to protect the lower green parts of each stool from frost, although the upper 12-18 inches of the flower stalks may be severely frosted. If normal late autumn or early winter rains occur, there is usually sufficient penetration of moisture to maintain a good regrowth of green leaves on the base of each stool. Each winter the horses at the experiment station have maintained excellent condition when grazing on this lower green material. Analyses of samples of this growth taken in the winter of 1943 indicated that its food value was comparable to samples of green but somewhat checked wheat plants grown during that dry winter. Further samples taken in the winter of 1944 indicated that under conditions of luxuriant growth for both the wheat and the grass, the food value of the green shoots around the stools of Rhodes grass were equal to if not superior to the wheat plants in the early grazing stage—particularly in regard to the crude protein content of the oven dried material.

SOIL INVESTIGATIONS.

The main types of soil on the experiment station appear to be well supplied with the plant foods required by the cotton plant. Past investigations have indicated, however, that the balance of the soluble form of nitrogen—nitrates—with the other plant foods, has, in conjunction with the soil moisture, a very important bearing on the type of plant developed. Each season a voluminous number of samples is therefore taken for determination of the moisture and nitrate-nitrogen content of the soils in various treatments. By means of this work it has been possible to obtain an understanding of the basic soil problems that could not have otherwise been ascertained. Frequently this sampling has also provided data that has explained unusual crop behaviour.

In the season under review, the moisture determinations portrayed clearly the effect of the smashing hail storm at mid-November—the resultant compact surface soil in cotton cultivations preventing the penetration of moisture more than 18 inches until towards the end of January. By mid-February after a fortnight of hot dry weather, the sappy vegetative rain-grown cotton had nearly exhausted the moisture in the top 18 inches of soil—thus showing the necessity of having ample moisture in the lower subsoils.

Further evidence was obtained this season of the value of a cover crop to protect the permeability of a soil. Under comparable conditions, the moisture from the end of October and mid-November storms penetrated 21 inches in an area of Rhodes grass on a heavy clay loam, and only 11½ inches in a well-prepared seed bed for cotton. Similarly after the January rains it was found that the moisture had penetrated 19 inches in a medium clay loam on which Rhodes grass was growing, compared to 9 inches in a two-year-old cotton cultivation following Rhodes grass. An investigation in a clay loam in which grain sorghum was growing indicated once more the value of a wet subsoil to ample depth at planting time. Although only limited rainfall was experienced during the growth of the sorghum, good yields were obtained, the sorghum exhausting the moisture to a depth of nearly 6 feet.

In fertile virgin grassland the particles of the finer soils, such as the loams and clay loams, usually occur as fair sized aggregates. The resultant pore spaces between these aggregates assist in imparting a degree of permeability to the soils which generally allows of satisfactory penetration of rainfall. When such soil is ploughed and repeatedly cultivated annually for many years, many of the aggregates are broken into finer sizes with a resultant impairment of the permeability of the soil. Under the irregular rainfall experienced in the main cotton-growing districts, it is highly advisable, therefore, to practise crop rotations, which will maintain a satisfactory degree of permeability—particularly in heavy clay loams.

At the experiment station, a rotation consisting of Rhodes grass established for three years followed by three annually planted crops, and then repeating the cycle, is the most effective method evolved so far to maintain a suitable permeable surface. To ascertain the degree of aggregation of fine particles of soil brought about by the establishment of Rhodes grass for three years on a clay loam, the percentage of water stable aggregates was determined by sieving samples of the soil under water. A companionate soil which had been cultivated for 20 years—mostly repeatedly to cotton—was used as a comparison. It was found that 42 per cent. by weight of the soil after grassland would not pass through a sieve with .7 mm. apertures—compared to 34 per cent. of the old cultivation. Similar sievings of a lighter clay loam indicated that 19 years of cultivation compared to virgin grassland had reduced the percentage of water stable aggregates from 49 to 23.

W. G. WELLS,

Specialist Adviser, Experiment Stations, and
Cotton Specialist.

(4) REPORT OF THE OFFICER-IN-CHARGE, SCIENCE BRANCH.

The activities of the Science Branch may be discussed under the headings of entomological investigations, plant pathological investigations and botanical investigations, these headings corresponding with the three sections of the Branch is Entomology, Plant Pathology, and Botany.

ENTOMOLOGICAL INVESTIGATIONS.

D.D.T.

Supplies of the new insecticide D.D.T. (dichloro-diphenyl-trichlorethane) became available during the year for experimental purposes in both dust and spray forms. In each case, the formulae were based on specifications worked out by the Commonwealth Council for Scientific and Industrial Research. The dust contained D.D.T. in pyrophyllite and had good flowing properties; the spray emulsion contained D.D.T. in solvent naphtha and was very stable when diluted for use. In field experiments against a number of pests, D.D.T. has been compared with other insecticides in general use. Unless otherwise stated 2 per cent D.D.T. dusts and 0.2 per cent. D.D.T. sprays were used throughout. The results may be summarized thus:—

Cabbage Moth.—Cabbage moth, *Plutella maculipennis* Curt, has been very active during the past season. Showery weather during the growing period has lessened the efficiency of dusts and sprays containing lead arsenate or derris, the two insecticides normally used for controlling the pest. In an experiment on cauliflowers at Aspley standard insecticides were applied at approximately weekly intervals; insecticides containing D.D.T. were applied when treatment was considered necessary after an examination of the plot data on larval populations each week. Complete protection was given to the crop by two D.D.T. sprays or dusts applied during the growing period. Within a few days after the initial treatment in each case, i.e., using the spray or the dust,

larvae were completely absent from the crop, which remained clean for at least three weeks.

Beet Webworm.—Outbreaks of the beet webworm, *Hymenia recurvalis* Zell., occur during the autumn when weed hosts such as the black pigweed die down and the moths transfer their attention to the cultivated crop. At Sunnybank treatments were applied at an early stage of an outbreak. A single application of a D.D.T. dust or spray six weeks before the harvesting period gave complete control of the pest for the remainder of the growing period. The attack was severe and, in contrast to the control obtained with D.D.T., the tops of the plants were completely destroyed in plots treated with a derris dust containing 1 per cent. rotenone, or a 50 per cent. cryolite dust left untreated.

Corn Ear Worm.—Sorghum heads, bagged shortly before anthesis in order to prevent cross pollination, are regularly subjected to very heavy infestation by corn ear worm, *Heliothis armigera* Hb.; the eggs are laid before paper bags are fitted to the heads and the larvae developing within them are sheltered from natural enemies. A 1 per cent. D.D.T. dust applied at Biloela before the bags were fitted, gave complete control of the pest, the heads being free from injury when they were opened-up some three weeks later. A 50 per cent. lead arsenate dust reduced the injury a great deal though to a much less extent than the D.D.T. dust. Untreated heads were almost all seriously injured.

In cotton at Biloela, D.D.T. dusts applied during the peak of moth activity did not reduce the number of eggs laid on the terminals, the amount of square damage, or the number of larvae per 100 squares when these were assessed according to standard techniques. It would seem, therefore, that when the larvae feed externally, the insecticide may prove very efficient; when the larvae feed in sheltered situations which are not normally penetrated by insecticides, less efficient control may be obtained.

Potato Tuber Moth.—The potato tuber moth, *Gnorimoschema operculella* Zell., is primarily a pest during the dry spring and early summer months. Potato and tomato crops grown at this period of the year may suffer severely. A field test was located at Cleveland, where 1 per cent. and 2 per cent. D.D.T. dusts were applied to a heavily infested potato crop two weeks before harvesting. Seven days after treatment, sample tops from each plot were shredded over a sheet and the larvae counted. Populations were reduced by the treatments, but the numbers of larvae in the leaves were still very high. It is possible that sprays may be more efficient against this and other insects with leaf-mining habits.

Green Vegetable Bug.—The green vegetable bug, *Nezara viridula* L., was very numerous during the spring months after it emerged from hibernation. Attacks in tomato crops were particularly common, and D.D.T. was tested in a crop at Pinkenba where a crop had been abandoned after the completion of the first pick, owing to the wastage caused by the pest. Dusts were used at strengths of 1 per cent. and 2 per cent. and sprays at concentrations of 0.1 per cent. and 0.2 per cent. Results were estimated on the number of dead bugs found beneath the plants in each of the several replicated plots. Good kills were recorded, particularly from the sprays, and it seems that the insecticide will effectively control this pest. Incidentally, another bug pest of tomatoes, *Lygaeus hospes* F., was common in the area and several were found dead in the treated plots.

Cotton Jassid.—The cotton jassid, *Empoasca maculata* Ev., is a major pest of the cotton crop, particularly in seasons when the crop matures late. Control by insecticides has not hitherto been practicable because frequent treatments are required and these are not economic. At Gayndah, the value of D.D.T. in the control of this pest was studied in an experiment which gave comparisons between untreated plots, plots dusted weekly with a 3 per cent. nicotine dust and plots treated weekly with a 2 per cent. D.D.T. dust. Results were obtained in all plots from nymphal counts on sample terminals each containing six leaves. Egg-laying was not inhibited by D.D.T., but nymphal development did not proceed very far and recorded populations were therefore consistently low.

In small scale exploratory work on the related tomato jassid, *Empoasca terra-reginae* Paoli, similar results have been obtained; confirmation will probably be obtained when the data from current field work on the subject is available.

Bean Fly.—Bean fly, *Agromyza phaseoli* Coq., is the most serious pest of edible beans with which growers have to contend. Existing control measures are reasonably efficient but they involve the application of a white oil-nicotine sulphate spray at short intervals and consequently make considerable demands on the growers' time. D.D.T. dusts and sprays have been used in control experiments in Brisbane designed to compare this insecticide with white oil-nicotine sulphate sprays. Results were estimated in terms of yields, plant survival, and injury ratings. Both D.D.T. dusts and sprays gave excellent control of the pest under severe conditions. Intervals much longer than the customary four days may be permissible between treatments, and this should simplify the application of control measures. Egg-laying is not inhibited by treatment, but few larvae emerge from the eggs and these

seldom survive. D.D.T. will probably supercede the insecticides at present in use for the control of the pest, particularly as its use will involve less work and somewhat less precision in timing the applications.

Sorghum Midge.—The sorghum midge, *Contarinia sorghicola* Coq., is perhaps the most important pest of grain sorghums. Losses are particularly heavy in late planted crops subjected to infestation from earlier planted fodder sorghums and other cultivated and wild hosts. In the insectary, flowering sorghum heads were treated with D.D.T. and then exposed to an attack by midges emerging from heavily infested heads collected in the field. D.D.T. used either as a dust or a spray at Biloela almost completely prevented midge infestation during an attack which destroyed unprotected heads. The data on seed setting in the experimental heads and the number of midges bred from them were in complete agreement. The habits of the pest are such that protection of the crop during the eight-day period following the commencement of flowering would ensure a payable crop. A single application of an efficient insecticide might therefore give economic control of sorghum midge. D.D.T. dusts may thus provide a solution to the problem.

Onion Thrips.—The onion thrips, *Thrips tabaci* Lind., has many hosts, among which cucumbers are not the least important. D.D.T. dusts were tested in experiments at Cleveland and results were determined from thrips counts made on a number of leaves taken from selected plants in both treated and untreated plots. Neither 1 per cent. or 2 per cent. dusts reduced the population of adult thrips within two weeks from the commencement of treatment. There were indications, however, that the rate of reproduction declined for fewer larvae were found on treated plots at the second weekly reading.

Red Spider.—Last spring, red spider, *Tetranychus urticae* Koch., caused a great deal of damage to cucurbits in the Cleveland district. Dusts containing 1 per cent. and 2 per cent. D.D.T. were applied to a heavily infested cucumber crop and results were assessed at weekly intervals by counting the number of adult mites found on selected leaves taken from a number of plants in both treated and untreated plots. The pest was unaffected by treatment but the position was in no way aggravated by the D.D.T.

From the above summary, it is clear that D.D.T. has distinct possibilities as an insecticide for agricultural purposes. Some pests for which control measures have not been available should be manageable on the farm in future. Others which formerly could not have been controlled because of economic factors may now become amenable to treatment. In either case, the long-term effect normally obtained with D.D.T. is such that costs of control work on these pests should be materially reduced. It is hoped, therefore, that dusts and sprays comparable to those used in experimental work will soon be commercially available.

PUMPKIN BEETLES.

Studies on the pumpkins beetles, *Rhabidopalpa addominalis* F. and *Ceratia hilaris* Bois., were continued during the 1944-45 season, at Gayndah. Field experiments were designed to evaluate the merits of lead arsenate in straight and composite dusts, as well as the efficiency of the carrier used with the insecticide. Rockmelons and cucumbers were planted in the several experiments, and results were assessed from both plot yields, and the insect populations seen on the plants. All dusts containing lead arsenate reduced the numbers of beetles on the plants to low numbers for a period of at least five days; a levelling up process was then recorded until the insects were again evenly distributed throughout the several plots. Lead arsenate sprays were less efficient than the corresponding dusts. Repellancy is probably an important requirement in any insecticides used for the control of the pumpkin beetles; insects on plants dusted with lead arsenate are invariably congregated round the young growth which develops subsequent to treatment. There are also indications that the colour of the dust has some bearing on its repellent properties; composite dusts with a blueish tinge are less efficient in controlling the pest than straight dusts containing the same amount of lead arsenate in a white carrier. These repellent properties are particularly desirable in spring crops for overwintering adults then attack the germinating seedlings and a considerable amount of damage may be done before any poison takes effect. The insecticide should, therefore, carry both toxic and repellent properties. A 25 per cent. lead arsenate dust meets these requirements and it can be used on the youngest of plants at weekly intervals. Treatment after the commencement of flowering is dictated more by the incidence of the leaf eating ladybird, *Epilachna 28-punctata* Fabr., than by the numbers of pumpkin beetles on the plants. The latter pest is seldom sufficiently numerous in flowering and fruiting vines to cause severe injury.

POTATO TUBER MOTH.

In a potato varietal trial carried out at Home Hill by the Agricultural Branch, tuber moth, *Gnorimoschema operculella* Zell., was very active. The damaged tubers in the several plots were therefore weighed. The least damage (4 per cent.) occurred in Bismarck and the proportion increased through Manhattan, Carman, Factor and Katahdin to Brownell (22 per cent.). This differential susceptibility

between the several varieties may have a number of contributing causes chief among which are:—(a) The time of maturity which determines the duration of the attack on the underground tubers and (b) the depth of tuber formation, a character which varies a great deal between varieties and which controls the amount of soil cracking and thus the ease with which the insect can penetrate underground to the tubers.

During the past two years derris dusts have been recommended for the treatment of potato tubers in order to protect them from attacks by the tuber moth during the storage period. The more important potato-producing areas are located in Southern Queensland and the crops are grown under irrigation. Though two crops are grown each year only the spring crop is severely attacked by the pest. Both table and seed potatoes from the crop are stored during relatively humid weather when dusts such as magnesite and pyridine fail to give adequate protection and cannot replace derris, which has no such limitation. In the far North the crop is harvested in late winter and early spring when the weather is normally dry. Magnesite or pyridine may, under these circumstances, be quite suitable for tuber treatment. An experiment at Ayr in 1944 was therefore carried out by the Agriculture Branch to check the influence of magnesite on the storage life of potatoes. It clearly demonstrated that magnesite may be used for the treatment of potatoes grown in North Queensland, though even here it may be safer to use derris dusts on late grown crops harvested from October onwards.

CORN EAR WORM.

Control measures for the corn ear worm, *Heliothis armigera* Hb., have again been studied in the cotton crop at Biloela. Peaks of egg-laying occurred in mid-November, mid-December, early January, and late January. The last three of these coincided with the squaring period, but only that in early January was followed by any considerable amount of injury to the crop. The other peaks were not followed by larval outbreaks. Such behaviour is not uncommon and may be due to the activities of egg parasites or the unsuitability of the crop for larval development at the time.

Drought conditions during the middle of the season brought out distinct swale effects in plant growth in all areas other than those which were irrigated. In these swales, the cotton was more vigorous and, during bursts of moth activity, eggs were laid in them for a comparatively long period. It would appear, therefore, that the moths select with some care the plants on which to lay their eggs.

In the experiments at the Experiment Station insecticides were applied during peaks of egg-laying activity; usually three applications would be made at four-day intervals during each peak. Increased yields were obtained with a 90 per cent. lead arsenate dust and a lead arsenate spray containing 2 lb. of lead arsenate in a solution of 1 gallon of molasses in each 6 gallons of water. They reflect the amount of control obtained in early January and are confirmed by records for both square damage and larval populations during the critical period. The increased yields were garnered during the first pick. In the second pick, the control plots yielded at least as well as the treated plots. Aphid attacks were more severe late in the season on all treatment plots, though particularly on those treated with the lead arsenate sprays. The seasonal behaviour of aphids during the year suggests that lead arsenate does not initiate aphid outbreaks; it merely permits them to run amok when they naturally occur, possibly because natural enemies are adversely affected by the treatments.

The present status of the corn ear worm investigations can be briefly summarized as follows:—Egg-laying occurs in bursts which can be detected easily by routine egg counts during the growing period of the crop. Conclusions drawn from the egg count data on a single farm are applicable over a whole district. Crops can be protected if the insecticide is applied during these peaks; the larvae acquire a lethal dose of the poison before any considerable amount of damage has been done. Lead arsenate, however, is not particularly toxic to the pest and complete control is seldom obtained. Hence in cotton, although treatment gives increased yields when the insecticide is properly used, control measures cannot be considered foolproof.

QUEENSLAND FRUIT FLY.

Present recommendations for the control of the Queensland fruit fly, *Strumeta tryoni* Frogg., require the collection and destruction of fallen fruit, luring which both destroys numerous fruit flies and also gives the farmer an accurate index of fly activity, and the use of bait sprays when flies are numerous in the orchard. It is not possible to evaluate the combined effect of all three measures in a single experiment and continuous observations have therefore been made in a few orchards where operations are under entomological supervision and regular records of fly activity and fruit losses are kept. In this work, the luring records give a clear picture of fly activity for more than twelve months, and have added very appreciably to an understanding of the relative importance of the several control measures employed against this pest. In orchards where control measures have been supervised,

the fruit wastage during and subsequent to the autumn peak of fly activity has been kept to low levels.

OIL SPRAYS.

There are many parts of Queensland where oil sprays are used on a relatively small scale owing to the lack of adequate supplies of soft water with which to prepare emulsions. In some districts such as the Lockyer, Rockhampton, and Gayndah, where both surface and underground waters may be relatively hard, oil emulsion sprays prepared from them frequently break. In most cases, the lack of stability in such emulsions is due to the relatively high magnesium content of the water; 50 p.p.m. are sufficient to make the water incompatible with oil emulsion concentrates. There are at least two ways of overcoming the effect of magnesium salts on the stability of oil emulsion sprays. The first is to immobilise the salt with a suitable reagent and the other is to precipitate it. In recent experimental work, sodium hexametaphosphate and trisodium phosphate were each added to hard waters at the rate of 2 oz. per 100 gallons, and both gave good emulsions with commercial oil concentrates. Sodium hexametaphosphate dissolves easily and does not throw a precipitate; apparently the magnesium enters the sodium salt to form a product which is both soluble and chemically inert. Treated water can therefore be added to oil emulsion concentrates with safety. Trisodium phosphate, on the other hand, throws a precipitate when added to a hard water. It may be necessary therefore, to decant the water from the precipitate before preparing the oil emulsion; otherwise nozzles blockages may occur.

POWDER POST BEETLE.

The susceptibility of timber to attacks by the powder post beetle, *Lyctus brunneus* Steph., is determined mainly by the starch content of the wood. For some years past, work has been in progress to determine the feasibility of preventing attacks by reducing the starch content of the tree by high ringing, i.e., removing a strip of bark right round the tree at the top of the commercial bole. High ringing is carried out some months before the tree is felled and treatment schedules have already been developed for two important hardwood species, spotted gum, and lemon scented gum. The work has been extended to red tulip oak, an important cabinet wood which normally has a wide band of *Lyctus*-susceptible wood. Mature trees were treated in December and April when sapwood samples showed that starch reserves were high. After ringing, periodical starch determinations indicated that within twelve months the starch content of the sapwood in practically all trees was less than that required for an attack by the pest in sawn timber. The rate of starch depletion varied from tree to tree; some experimental trees could have been felled six months after ringing, while all except two could have been felled safely after twelve months, the remaining two probably in fourteen months. None of the experimental trees originally with more than a moderate amount of starch showed any ill-effects from the treatment. If high ringing should become a routine feature of logging practice for this species, determinations from samples taken at breast height can be relied on to give a reasonably accurate measure of the starch content of the trees in the forest, both before and after ringing.

Boric acid baths are commonly used at sawmills to make plywood immune from attacks by the powder post beetle. Treatment schedules are designed to deposit at least 0.14 per cent. of boric acid by weight in the timber, the concentration known to be lethal to the pest. Many secondary timbers such as white cheesewood could be used for a variety of purposes if boric acid treatment of the sawn timber could be carried out. Most of them possess a considerable amount of sapwood with a high starch content and the normal wastage through borer damage is high. Sawn timber from some of these secondary timbers has been treated with boric acid solutions at varied concentrations and times of exposure. The results show that lethal concentrations of boric acid are retained by 1½ inch white cheesewood stock after six hours immersion in a 2.5 per cent. solution of boric acid held at temperatures of approximately 200 deg. Fahr. Six hours exposure to a boric acid concentration of 1.25 per cent. are adequate for ¾-inch stock of the same timber. Treatment schedules of this kind are applicable to timber just cut from green logs. Comparable schedules have still to be worked out for other species of potential economic importance.

CITRUS RED SCALE.

The citrus red scale, *Aonidiella aurantii* Mask., was more injurious during 1944-45 than for some time past, particularly in subcoastal areas. Seasonal conditions were very favourable for the insect, but the present setback in some districts is partly a legacy of grower preoccupation with the larger horned citrus bug, *Biprorulus bibax* Bred., which is normally controlled by fumigation. Present control schedules for citrus pests in the Gayndah district, for example, stipulate one full-dosage fumigation and two or more half-dosage fumigations during the year for the joint control of both the bug and the scale. The frequent omission of the full-dosage treatment which is primarily a scale control measure, allowed this pest to get

out of hand. During the summer, when the severity of the attack was appreciated, fumigation could not be carried out efficiently owing to excessive wind; oil sprays were therefore used extensively, though they tend to delay the maturity of the fruit and induce a certain amount of unevenness in colour.

BANANA FRUIT-EATING CATERPILLAR.

The banana fruit-eating caterpillar, *Tiracola plagiata* Walk., was studied in detail during an outbreak at Gympie in 1927 when bananas and cucurbits were severely attacked by this pest. Since then, the insect has not been important until March of this year, when larval swarms were reported in the Lacey Creek district near Dayboro. These swarms first appeared in native bryony but they subsequently migrated to an adjacent banana plantation, where they gouged huge holes into the pseudo-stems and invaded the throats of the suckers and small plants. The application of a Paris green-bran bait on the ground and over the plants proved a very effective control measure.

LOCUSTS.

The yellow-winged locust, *Gastrimargus musicus* F., persisted in coastal areas of central and north Queensland during the spring and early summer months. Hopper swarms of considerable density occurred in the Burdekin district but further south, little damage was reported. Later in the season, flier swarms appeared but they were less dense than in the previous year and did not persist for any length of time. Few egg beds were established during the autumn and it is possible that the pest, which is not a coastal species, will be less destructive in these areas than it has been during the past three years.

Another species, the spur-throated locust, *Ausiracris guttulosa* Walk., caused some damage to fodder crops during the year in central and southern Queensland. Like the yellow-winged locust, it is normally a subcoastal insect which may invade coastal areas during dry seasons. Adult swarms were numerous during late summer. Maize, grain sorghum, Sudan grass, cotton and even citrus trees were attacked.

LANTANA BUG.

Since the initial colonies of the lantana bug, *Telionemea scrupulosa* Stal., were supplied by the Council for Scientific and Industrial Research, distributions have been made from time to time to various parts of the State. It is now well established in coastal districts of northern and central Queensland. In the south, some colonies have persisted for several years and have spread fairly considerably. A large number of new colonies were distributed this year in the hope that establishment throughout the southern districts might be effected; an early spring simplified operations a great deal, for the bugs could be collected in October without difficulty. In the autumn bugs were located in some districts far from the known liberation sites. This phenomenon usually precedes natural establishment in a district and gives the hope that ultimately the distribution of the bug in all parts of the State will coincide with that of its host plant. In areas where the bug has been present for some years the growth of the lantana may, at times, be checked. Sometimes other weeds, such as guava and wild raspberry, supplant the lantana and create weed problems of another kind.

MISCELLANEOUS RECORDS.

Miscellaneous records of entomological interest include:—The cabbage white butterfly, *Pieris rapae* L., has now penetrated most of the vegetable producing areas in southern Queensland since its arrival three years ago. The Buprestid beetle, *Neospades chrysopygia* Germ., attacked the flowers and young fruits of strawberries at Gayndah. The cabbage cluster caterpillar, *Crociodolomia binotata* Zell., was particularly important on cruciferous crops in central and north Queensland. The Lycaenid pod borer, *Zizeeria labradus*, caused some damage to French beans during the spring on the Darling Downs. Adults of *Nezara viridula* L., were very numerous in spring-grown vegetable crops, in spite of the fact that the introduced egg parasite, *Microphamurus basalis* Woll., has been very active for some time past. The Cerambycid beetle, *Sybra centurio* Pasc., injured soy beans; the larvae burrow down the stems in much the same way as do those of the lucerne stem borer *Zygrita diva* Thomps.; the Phycitid pod borer, *Etiella zinkenii* Meyr., was also recorded from soy beans and some other legumes. The onion thrips, *Thrips tabaci* Lind., was associated with sterility in onion seedheads in the Lockyer Valley. Larvae of the Noctuid, *Acontia congenita* Hamps., were numerous in cotton crops at Biloela following heavy egg-laying in January. A small red mite, *Trichodenus* sp., which occurs in the axils of common couch grass is common in many bowling greens and threatens to become a serious lawn pest.

PLANT PATHOLOGICAL INVESTIGATIONS.

POTATO DISEASES.

Diseases of the potato crop have been an important limiting factor to production during the war period. The Fusarium wilt which caused serious losses during the autumn

of 1944 in southern Queensland, was almost absent from the following spring crop. Some damage occurred in the autumn crop just harvested, particularly in early plantings on heavy soils. Experiments designed primarily to assess the influence, if any, of fertilizer applications and cultural practices on the incidence of the disease gave negative results. In one of these the disease failed to appear; in another, target spot swept through the crop before it was mature and destroyed the haulms. This outbreak of target spot indicates the risks involved when infective material from an earlier crop occurs near an experimental area. At present, it seems that the causal organism of Fusarium wilt is normally present in most Lockyer Valley soils; unless temperature and moisture conditions are precisely suited to the fungus, however, no large scale outbreak can develop. Cultural and manurial treatments may affect the incidence of the disease when conditions are favourable for it, but they do not otherwise affect the position. Until the precise requirements of the organism have been determined with some certainty, it is unlikely that control measures will be devised for field use, for they are almost certain to take cognisance of such things as times of planting and rotational practices.

The wastage caused through virus diseases in the potato crop is much less than it was some years ago. This can be ascribed largely to the greater use of certified seed which has been harvested from relatively disease-free crops. The increase in the acreage planted to potatoes during the war period has been such that the certified seed obtained from the southern States was much below Queensland's requirements for the spring crop. Deficiencies were made up from uncertified seed. As a consequence the virus disease position is deteriorating to some extent, though it is still much better than in pre-war days.

Leaf roll is not common in the Lockyer Valley, but in North Queensland, where the Brownell variety is grown extensively, many crops are infected. Top necrosis which is associated with one or other of a number of viruses was fairly general in the Lockyer district; in some crops, 30 per cent. of the plants showed typical symptoms and yield reductions of approximately 10 per cent. were estimated. Calico, a minor virus disease of the potato, has been recorded for the first time in the district. It will be quite obvious from the foregoing summary that the stability of the potato industry largely depends on the machinery devised to limit the incidence of virus diseases. The restoration of pre-war deliveries of certified seed tubers may be expected to improve the field position a great deal.

DISEASES OF ROOT CROPS.

The war brought about a considerable increase in the acreage planted to root crops such as carrot, beet, and turnips. Attention has therefore been drawn to the diseases which cause losses in these crops on the farm and in storage. Two leaf diseases of the carrot, *Macrosporium* leaf blight and *Cercospora* leaf spot, caused a considerable amount of damage to crops. Both diseases tend to get out of hand in wet weather during the cool winter months. Conditions during the past season were particularly favourable and outbreaks were common.

Isolated attacks by crown rots occurred in some root crops, particularly carrot and beetroot. The organisms involved, *Sclerotium rolfsii* and *Rhizoctonia* sp., invade many host plants and once the diseases are established in a paddock, eradication is difficult. Outbreaks occur in localised patches. If the affected plants are promptly removed along with any attached sclerotia and the soil is treated with a copper sulphate solution, the disease can be checked. Failure to apply the appropriate control measures may lead to a rapid spread of the diseased area throughout the farm.

Transport and storage rots have been prevalent and attention has been directed to the factors contributing to the occurrence of these rots and the measures to be taken for their avoidance.

SYMBIOTIC NITROGEN-FIXING ORGANISMS.

The legume inoculation service has been continued, and the demand for cultures, particularly for lucerne, cow-peas, field peas and lupins has increased. The demand for cultures is now approximately one thousand per annum. Many farmers regard seed inoculation as an essential agronomic practice and this is a logical development in the service, for the strains of *Rhizobium* spp. selected for distribution to the farmers are strains chosen for their nitrogen-fixing efficiency and are regularly tested by standard laboratory methods.

Strains of *Rhizobium* spp. from native legumes have been compared with others in the departmental collection. Several new hosts have been added to the cowpea cross inoculation group, and isolates from species of *Acacia*, *Mirbelia*, *Platylobium*, *Jacksonia* and *Pultenaea* have shown considerable promise in this group. Field responses to inoculation have been obtained in experiments with the cowpea and pea groups.

Strains of *Rh. lupini* performing satisfactorily in glass-house trials on New Zealand blue lupin have not given satis-

factory results on granitic soils in the Stanthorpe district where this legume is needed in orchards as a green manure, and the possible role of trace element deficiencies, both with respect to the behaviour of *Rhizobium* and to the growth of the plant, is being investigated in conjunction with officers of the Horticultural Branch.

NON-SYMBIOTIC NITROGEN-FIXING BACTERIA.

A survey has been completed of the occurrence of non-symbiotic nitrogen-fixing bacteria in cultivated and virgin soils, with particular reference to the soils of south-eastern Queensland. Anaerobic *Clostridium* spp. have been found almost constantly. The occurrence of *Azotobacter chroococcum*—the only species of *Azotobacter* encountered—was found to be conditioned by pH of the soil. Below pH 6.0 very few soils contained this organism. Above pH 6.5 a large percentage of samples were positive and in the case of the black earths of the Darling Downs, and the Fassifern and Lockyer districts, *Azotobacter* occurred in relatively high numbers.

INSECT TRANSMISSION OF PLANT DISEASES.

Preliminary investigations have been made of the possible role of the Queensland fruit fly, *Strumeta tryoni* Frogg., in transmitting plant pathogens or rot-producing organisms. Bacterial floras within surface sterilized adults of both sexes, and inside surface sterilized puparia have been demonstrated. To date, inoculations into citrus fruit with the organisms isolated have proved negative.

GANODERMA ROOT ROT.

In 1942-43 the death of citrus trees in the Gayndah district was reported, the causal organism being a root rot fungus in the genus *Ganoderma*. The organism subsists on dead roots of native trees which remain in the soil after the land has been cleared and planted. Later it attacks the living roots of citrus trees and root rots then develop. The affected trees, after struggling for some years, ultimately die. The toadstool-like fruiting bodies finally appear on the butts of the dead trees. Control measures involve a great deal of hard work. The dead and dying trees must be removed together with the diseased roots, and the soil must be saturated with a copper sulphate solution before the gap in the orchard is replanted. There are indications that the fungus is tolerably widespread in the Gayndah district for further attacks have been reported from orchards where the disease was formerly unknown.

DECLINE IN GLEN RETREAT MANDARINS.

In subcoastal areas, Glen Retreat mandarins bear well and the fruit finds a ready sale in both local and southern markets. The trees have a number of idiosyncrasies, chief among which is a tendency to overbear. This defect can, to some extent, be overcome by careful attention to pruning during winter and thinning the crop when the trees are carrying fruit. Another trouble which may have some connection with the foregoing habit is known as "decline," an expression used to describe the abnormal behaviour of both young and old trees. The leaves turn yellow and often show tip curl prior to the onset of leaf fall and dieback. Temporary recovery may occur if the tree is prevented from bearing fruit for a season or two and receives adequate manual attention. Sometimes no recovery takes place and the trees die. The cause of the phenomenon is obscure. Faulty nutrition seems an obvious explanation of the phenomenon but the position cannot be entirely remedied by fertilizer treatment. Differences in the mycorrhizal activity between healthy and diseased trees have been noticed on the roots and the relevance of these to the phenomenon of decline is being studied. It is possible that cultural practices which tend to force the roots downwards and which deplete the organic matter in the surface soil may depress mycorrhizal activity and otherwise interfere with the nutrition of the tree.

ROOT ROTS IN APPLE TREES.

During recent years, die back in apple trees has been increasing in importance at Stanthorpe. The disease is not confined to old trees for in some replanted or newly planted trees, serious losses occurred in seedling trees which have just commenced to bear fruit. The incidence of the disease is unusual, for trees may be growing vigorously alongside trees which have succumbed. *Armillaria mellea*, the fungus most commonly encountered in fruit trees affected by root rots, is apparently not implicated. Work is therefore in progress which may establish the identity of the causal organism and open the way for the establishment of efficient control measures.

CROWN ROT IN PEANUTS.

Some years ago, crown rots were not uncommon in peanuts at Kingaroy, if the seasonal conditions were at all wet. The greatest wastage would normally occur before the peg stage had been reached but plants could still collapse during

the remainder of the season. Half the stand was sometimes affected. Weak parasites which enter the plant through minor injuries are usually present on the seed. Treatment with organic mercurial dusts was therefore introduced some years ago and is now standard practice at the silos from which seed is distributed to the farmers. It proved highly effective, and crop failure in the field through organisms of this kind has been negligible for many years. A recurrence of the trouble took place last spring even though the seed was treated in the usual way with a fungicidal dust. Conditions were certainly favourable for the disease in the field but no more so than in previous years. It seems probable that spores of the causal organism survived treatment and later attacked the germinating plant. This could only happen if they had germinated and penetrated injured cotyledons before seed treatment or else lodged in crevices in the seed not entered by the dust. The former is unlikely to occur under reasonable conditions of storage; the latter is possible if shelling injuries are high. Actually the nuts were extremely dry when shelled and "splits" were numerous. It is possible therefore that incipient splits protected the organism during treatment with the fungicidal dust. The seed examined in Brisbane at the time of the field outbreak had a lower germination percentage than is normally considered desirable and carried a heavy infection of the principal organism responsible for crown rot.

RHIZOME ROT IN GINGER.

Since the re-establishment and expansion of the ginger industry on the north coast, pathological interest in the crop has largely centred round the incidence of rhizome rot, a disease in which depressed areas occur in the seed pieces at harvesting and extend rapidly during the storage period. The organisms involved in the rot are very difficult to control once the rhizome tissue is invaded. Precautionary measures recommended include the treatment of planting material when the crop is harvested with a corrosive sublimate dip or an organic mercury solution. Experiments have now been laid down at Buderim to check the efficiency of these recommendations. The problem is being studied in the stud plots maintained to ensure the availability of seed pieces which are true to type, and free from disease.

YELLOW STUNT IN LETTUCE.

During the past three or four years, lettuce growers in the metropolitan area have experienced considerable difficulty in growing the crop between April and August. The plants develop normally until they are thinned but subsequently growth is stunted, the leaves are yellow in colour and harsh to the touch, and in acute cases brownish lesions which may be necrotic, appear on the leaves. In young crops, the disease may clear up with the advent of warm weather. The symptom picture suggests a virus disease, but secondary characters are not unlike those appearing in other plants grown on soils deficient in boron. Officers of the Horticultural Branch have now shown that a shortage of minor elements is not responsible for the disease, and work is in progress to establish the identity of the virus presumably involved.

BOTANICAL INVESTIGATIONS.

In the past year, officers of the Botanical Section have been occupied principally in identifying and reporting upon native and cultivated plants and plant products. Much of the material examined is submitted by farmers, pastoralists, school project clubs and officers of the Department. It includes weeds, cultivated plants, suspected poisonous plants and specimens of both rain and savannah forest trees. The identifications are frequently of considerable importance to research workers in other fields of agricultural science, for many problems of agronomic interest involve questions of plant ecology.

PLANT ECOLOGY.

Plant ecology is of particular importance in the botanical surveys carried out from time to time in connection with stock losses in pastoral areas. Usually travelling stock are involved. The plant collections made in the area, when analysed in terms of the known distribution of the several species, very often narrow down the range of culpable species and opens the way for feeding tests. This occurred in the case of Mackenzie River Disease, the plant being *Terminalia oblongata*. Ecological studies of this kind are usually a joint programme of the local agricultural or stock officer and the botanist.

MEDICINAL ALKALOIDS.

One feature of the year's work has been the identification of numerous plants submitted by both State and Commonwealth officers interested in the occurrence of medicinal alkaloids in the native flora. The work has been stimulated by the war-time shortage of some materials normally used in medical practice. It is of considerable technical interest, for little is at present known of the chemical composition of the diversified flora in the State.

RAIN FOREST FLORA.

The special knowledge of Queensland botanists, particularly in relation to the rain forest flora of tropical areas, has been recognized by the Services. Lectures and demonstrations in forest botany accordingly were given to personnel of both the Australian and Allied armies stationed in New Guinea. The exploitation of timbers in this area depends, of course, very largely on the correct identification of the millable species. At the present time, the Government Botanist is in the Solomon Islands on a six months' survey of the forests to the Protectorate. His services were requested by the High Commissioner of the Western Pacific for this purpose.

J. HAROLD SMITH,
Officer-in-charge, Science Branch.

(5) REPORT OF THE CHEMICAL LABORATORY.

The staff of the Chemical Laboratory has been occupied during 1944-45 chiefly by analytical work associated with various problems of crop and animal production.

SOILS AND IRRIGATION.

Restrictions in fertilizer supply, during the war years, have led farmers, in increasing numbers, to seek the help of the Plant Nutrition Section of the Chemical Laboratory, and the value of this work—carried on in association with officers of other branches of the Division—has again been amply demonstrated. The field has not been restricted to fruit and vegetable production, for it included farms engaged in the production of fodder for livestock. Hand in hand with these studies has gone a system of repetitive analyses of irrigation waters which have aided materially in formulating standards of tolerance by plants to dissolved solids.

WATERS.

Extremely dry conditions prevailed during 1944-45, both pastoral and agricultural areas being affected. Water supplies failed in many cases and new underground sources were developed. The number of water samples submitted for analysis was accordingly very high, stockowners in particular readily availing themselves of the offer made by the Department to test and advise upon—free of charge—all such waters.

It is most important that advice on the potability of saline waters should not err by the adoption of too rigid a tolerance standard. Not only the quantity but also the nature of the dissolved salts in these waters is important. The limits vary for different classes and for different ages of livestock; moreover, stock become inured to high degrees of salinity if the process is gradual. Hence no rule of thumb method is available for assessing the potability of waters. Borderline cases will arise. It is the unpredictable response of animals to such waters that interests the laboratory, and a programme for collecting evidence, wherever doubt exists, is being followed.

FOODSTUFFS.

Most of the materials coming under the heading of foodstuffs now relates to food for domestic animals, although, in the past, an appreciable volume of work has been done on human food for export. During the war years, however, this latter item has progressively diminished as export trade became more and more restricted to defence supplies.

When supplies of seed cake preparations were drastically reduced the Stock Foods Committee of the Department made strenuous efforts to increase the production of protein from animal sources. At the same time, the protein content of prepared and mixed foods was standardised. These steps involved the Chemical Laboratory in an increased number of routine stockfood analyses.

REPORT OF THE DIVISION OF ANIMAL INDUSTRY.

This is the first report of the newly established Division of Animal Industry, which now embraces all the activities of the Department dealing with live stock, including poultry.

The reorganisation has involved the appointment of a number of senior officers at Head Office in charge of the different branches. At the same time, several other senior officers mainly concerned with animal health work, have been placed in country centres, and to them will be delegated a considerable amount of responsibility, a procedure which, it is expected, will be both in the interests of the stock owners and the Department generally.

The following senior appointments have been made:—

Dr. John Legg, Acting Director of the Division; Dr. F. H. S. Roberts, Acting Director of Research; Mr. L. D. Carey, Chief Inspector of Stock, a position he held previously; Mr. F. Bostock, Officer in Charge of the Pig Section; Mr. P. Rumball, officer in charge of the Poultry Branch; and Mr. F. Gibney, Registrar of Brands.

Several of the stock districts, as defined by the Act, were grouped and each group placed under the control of a divisional

FACTORY GLASSWARE.

The testing and certification of recording instruments for the dairying industry was maintained during the year under review. As results from this type of work are of direct interest to the Division of Dairying, arrangements have now been made for the transfer of this service to the Dairy Research Laboratory.

EMERGENCY FEEDING.

At the height of the extremely dry conditions already referred to, the Agricultural Chemist and Bio-chemist was seconded for special duties in connection with the widespread programme of hand feeding of sheep which was then in progress. As a result of this action economical use was made of the available foodstuffs and losses in certain areas were greatly minimised.

BIO-CHEMISTRY AND TOXICOLOGY.

Reference must again be made to the unnecessary losses in stock which occur through the careless disposal of arsenic. The history of stock losses shows that many owners display a high degree of indifference to the safety of their own and neighbours' animals when poisoning trees or emptying arsenical dips. Consequently specimens containing arsenic outnumber all others received in connection with poison cases investigated by this branch.

No serious cases of poisoning by plants have been recorded, but work on one poisonous constituent of certain pasture plants, i.e., oxalic acid, has yielded valuable information. There is now strong presumptive evidence that oxalates in pasture plants may be more important in ovine hypocalcaemia than has been previously suspected.

TRACE ELEMENTS.

With the increasing publicity now being accorded to the role of minor elements in plant and animal nutrition, have come definite indications that zinc, iron, copper, cobalt, iodine, and boron deficiencies occur in parts of Queensland. Phosphorus deficiency has been well recognised for many years.

It is anticipated that work on cobalt and copper administration to sheep will be advanced in co-operation with the newly appointed veterinary officer in the Sheep and Wool Branch.

The investigation of the effects of excess minor element intake in stock is still restricted to fluorine, but the mapping of new areas where fluorosis occurs is progressing steadily. Certain bore waters have been found by this laboratory to contain levels of fluoride—the aetiological factor of this disease—exceeding all recordings in available world literature. This widespread disability in the less densely populated areas of the State has a marked effect on the livestock economy and hence on the prosperity of the districts as a whole.

CATTLE TICK STUDIES.

The ever-present problem of the cattle tick makes arsenic determinations a full-time occupation for one officer. The investigational programme of work on the cattle tick, conducted jointly by the Council for Scientific and Industrial Research and the Department of Agriculture and Stock, has been continued and facilities have been given in the Chemical Laboratory for the conduct of certain aspects of that work.

The Chemical Laboratory has, as a result of the recent departmental re-organisation, gained by its closer contact with other branches of plant industry. In that re-organisation it expects to at least maintain in all directions, and to improve in some, its usefulness to the department and to the State.

MONTGOMERY WHITE,
Agricultural Chemist and Bio-chemist.

veterinary officer located at a convenient centre within the area. The following five officers were appointed to districts with headquarters as shown:—

Mr. A. F. S. Ohman, Rockhampton; Mr. J. C. J. Maunder, Brisbane; Mr. A. L. Clay, Toowoomba; Mr. C. R. Mulhearn, Kingaroy; Mr. Marshall Irving, Townsville, also as Officer in Charge of the Animal Health Station at Oonoonba.

In respect of future additions to the veterinary staff, the position is that suitable students are being selected, given scholarships, and sent to Sydney for the main part of their training, only the very early part of the prescribed course being taken at Brisbane. It has been found necessary to do this since the University of Queensland Veterinary School was obliged to close in 1942 because of war conditions at the time.

SEASONAL.

At the beginning of the present year, the seasonal conditions presented two extremes. The Far North, which had received good summer rains was in a sound position, while abnormally dry conditions prevailed in parts of the South and

South-West. Parts of the North had rains in July, and this assured sufficient surface water. In the Central District, about Longreach and Barcaldine, the position was far from satisfactory. In the Central Highlands, the position was fair, but in the South-West, dry conditions prevailed.

During August, losses in sheep occurred on some properties, particularly those in the South-West and adjacent to the New South Wales border. Scrub cutting was difficult, because of the labour shortage. Lack of suitable feeding stuffs made extensive emergency feeding impracticable.

The spring and early summer rains were unseasonable all over the State, and warm, dry conditions prevailed. Later, however, rains were satisfactory in the North, North-West, and another good season was assured in those parts of the State, but in the Central District the position was far from satisfactory as the summer did not bring with it general rains anywhere. As the season advanced, and the cool weather approached, the situation became serious and stock losses occurred in the South-West, the Central District, and the Central Highlands. In addition, there were severe losses in lambs in some areas where autumn lambing had been attempted.

Heavy and widely-distributed rains occurred in parts of Central Queensland in May, up to 5 inches being recorded in some places.

At the close of the year pastures were drying off in the North and North-West, but were still plentiful. Some of the Central District was in a safe condition, but the South and South-West still awaited substantial relief.

ANIMAL HEALTH STATIONS.

The Yeerongpilly staff has occupied the buildings erected some time ago for the officers of the Veterinary Science Faculty of the University of Queensland and subsequently evacuated by them. The new quarters provide much greater floor space and are generally a very great improvement on the wooden structures built nearly forty years ago, and previously occupied as a laboratory. The new building should serve as a base for an improved research and diagnostic service.

YEERONGPILLY.

Work has been heavy and continuous, largely because of the increased volume of material coming forward for diagnostic purposes, and the relatively small staff available.

During the year 216 stud animals were accommodated for preimmunization against cattle tick fevers. This is a greater number than has been received in any one previous year. Most of the animals were of the beef breeds, but there has been an increasingly large number of dairy cattle coming forward during recent months.

In addition, 53 steers were prepared for sale to graziers as reservoirs for tick fever vaccine. More than 5,000 doses of blood for tick fever inoculation were distributed. Specimens numbering 17,045 were received and dealt with. Slightly more than 15,000 of these were blood samples for the agglutination test for brucellosis in cattle. The remainder represented a wide variety of disease conditions, and from all classes of stock.

OONOOONBA.

A considerable portion of the Oonoonba Animal Health Station was occupied for some time by the Army authorities.

Many of the activities, including some defence measures, of the Station were diverted to fulfil requirements of the National Security Regulations.

In the course of the year, 104 animals were received for preimmunization against tick fevers and more than 2,000 doses of blood were supplied. Eight animals were prepared as reservoirs for tick fever organisms and sold to graziers. In addition, the inoculation of some 2,000 station cattle were undertaken in the field. Specimens numbering 761 were received during the year. Most of these were, as was the case at Yeerongpilly, blood samples for the agglutination test for brucellosis in cattle.

In the disease control sections referred to later in this report, the diagnostic work has been, in the main, carried out at the two animal health stations.

DISEASE CONTROL.

CATTLE.

Buffalo Fly.—There has been a further extension of the buffalo fly during the year. On the coast the fly has spread from a point just south of Bowen to a point between Bundaberg and Gladstone, a distance in a straight line, of some hundreds of miles. No doubt this extension has been to some degree brought about by cattle travelling by train, for by spraying it is impracticable to drive all the flies from heavily infested animals and some are likely to be carried forward. When the parasites enter into a new area, even though in very small numbers, they multiply very rapidly if climatic conditions are suitable. Early in the winter, the fly appeared at Springsure and was, at certain points, not very far north of Tambo. Frosts delayed its movements to some extent. In the Dawson Valley

it has reached Baralaba. It is anticipated that with the advent of summer, and with it the usual rains, the fly will rapidly move up the Dawson Valley towards Taroom, Injune, and Miles, where it will probably extend further into the Darling Downs and towards Roma. It also is expected that before very long the fly will move into the South Burnett area via Eidsvold and Mundubbera.

During the year the spraying plants in use have been advanced from point to point to coincide with fly movements. The Hughenden plant has been closed for removal to Isis Junction. A second plant which was in operation at Emerald for some time has been closed. The Yaamba plant, just north of Rockhampton, is still in operation for cattle moving by rail along the coast in a southerly direction, while a second plant is in operation at Bororen for subsequent treatment of the same cattle.

When the Isis Junction plant is in operation it is expected that the Yaamba plant will be closed.

The Council for Scientific and Industrial Research has continued its programme of investigational work at Malanda on the Atherton Tableland and have recently increased its staff there. Early in the year a pamphlet was prepared setting out details of the trapping box referred to in the last annual report. Since the publication and distribution of this pamphlet, many traps have been erected and the general opinion is that they have been very effective in controlling the fly in areas where they have been placed.

Experimental work also has been continued with lethal spraying fluids, mainly with D.D.T. as the toxic agent. Experimental work at the present time is being directed towards employing both D.D.T. and the trap. It is believed that with a combination of the two it will be possible to keep the fly under control on dairy farms at least.

Trapping however, with or without the use of D.D.T., which is effective enough on the dairy farms, can never be expected to be as effective in beef cattle country, and unfortunately much of the area covered by the fly is given over to beef herds.

Cattle Ticks and Tick Fever.—Tick fever outbreaks have been numerous throughout the year and losses in stock have at times been quite heavy. Unfortunately, circumstances are such that many cattle are not seen sick and nothing is known of an outbreak until several animals have already died.

The tick has been fairly active, particularly on the coast; although the outbreaks of ticks outside the recognised permanently infested areas—such parasites having been carried past the clearing points by travelling cattle—have been mostly cleaned up. The situation, however, in respect of the arsenic-tolerant tick has not improved, and there is very good reason for now suspecting that ticks exhibiting considerable resistance to destruction by arsenic are very wide-spread. The problem remains a very acute one, and has on occasions proved a very serious handicap to the movement of cattle, particularly fat cattle which waste rapidly in certain circumstances. The monetary losses which result from hold-ups can be very serious and meatwork companies are embarrassed through disarrangements of killing programmes.

Research workers, consisting in the main of members of the C.S. and I.R. staff, who have been working on the problem have directed their energies chiefly towards finding a suitable medium for using D.D.T., which is very satisfactory in tick control under experimental conditions. It is hoped to extend this work during the coming months, and it also is hoped that it will be possible to incorporate the drug in the ordinary arsenical vat.

A field trial is in progress, using nicotine sulphate with arsenic in combination. Nicotine has been reported by the South African authorities as being very valuable in the control of the blue tick (*Boophilus decoloratus*), a parasite very similar in its habits and life history to the Australian cattle tick, when used in combination with arsenic. It is yet too early to report on the results of this trial.

Tuberculosis.—The outstanding work in tuberculosis control in dairy stock has been an attempt to deal with the disease in the herds supplying raw milk to the city of Brisbane. Near the end of 1944, an amendment of the *Stock Diseases Act* to deal with this particular aspect of the tuberculosis problem was enacted. Under this amendment, power was granted to veterinary officers to enter premises, carry out tests, and to remove all tuberculous animals found thereon. At the same time, a compensation fund was established, payments being levied at the rate of one farthing per gallon on raw and pasteurized milk, such payments going into a fund which was augmented by grants from the Crown.

Testing commenced in February, 1945, and by the end of June, the position was as follows:—

Herds tested	193
Number of cattle	10,585
Reactors	1,442

The first test of a small number of herds has not yet been completed. All reactors are sent for slaughter. Compensation is paid to owners at the rate of £6 for cows and bulls over

2 years; £3 for heifers or bulls between 1 and 2 years; and £1 for calves. Cattle are paid for when replaced by others in the herd, replacements being admitted only after tuberculin tests which prove negative.

The incidence of the disease has varied in the different herds within very wide limits, in some cases no reactors being found, while other herds have shown an incidence of up to 90 per cent.

None of the herds yet tested has been tested a second time, and it is regarded as imperative that some herds at least—i.e., those showing a high incidence at the initial test—should be re-tested as early as possible. Experience has indicated that there is very great difficulty in eradicating the disease in herds where it is well established, unless short interval testing is carried out.

In addition, a programme of testing was carried out on the Darling Downs. This scheme was undertaken in co-operation with officers of the United States Army and continued over a period of approximately six weeks, in the course of which 358 herds, comprising 15,418 animals were submitted to the test. The incidence of disease was remarkably low, only 104 reactors being found in 60 herds. In one herd there were 23 reactors.

This scheme was put through in a remarkably short period of time, and it indicates how very rapidly large numbers of animals can be dealt with when the organisation is complete. Great assistance was given to the Department by the officials of the Darling Downs Co-operative Dairy Association who arranged the programme, kept the records, and accompanied the officers of the Department on their rounds.

For the Royal National Association cattle show to be held in August it is a requirement that all cattle entered must be from tubercle-free herds, or must be certified as having been recently tested and found negative. This ruling applies to all cattle, whether of beef or dairy breeds. Hitherto, only beef breeds have been placed in this category, but now the dairy cattle also are included.

Up to the 30th June, 772 entries had been dealt with. As many cattle did not come from tubercle-free herds, work of testing of the remainder has devolved on the departmental officers, as the dearth of practitioners in this State has obliged owners to rely on them to complete their testing.

Apart from the testing already mentioned, this procedure has been confined to herds under the tubercle-free herd scheme, or in herds on farms from which tuberculous pigs have originated, and where the dairy herd has been suspected as the source of the infection.

McKenzie River Disease.—This condition, which has been known in certain parts of Central Queensland for very many years and has been constantly mentioned in previous reports, has recently been further investigated. Proof has been obtained that the disease is caused by the ingestion of leaves of the plant *Terminalia oblongata*, a small shrub or tree very common within the area affected, i.e., the tributaries of the McKenzie River, hence its name. The symptoms produced are unusual. One of the first signs noted is the refusal of the animal to move out of the shade, or, in other words, photophobia is present. Associated with this are characteristic symptoms involving the urinary excretory system. Urine is frequently ejected and often accompanied with straining and arching of the back. Other symptoms noted are loss of condition, oedema of the subcutaneous tissues of the neck and brisket, and discharge from the eyes. Most, if not all of these symptoms, have been produced in experimental animals. The *post mortem* changes are quite characteristic, the kidneys being a blue to slate-grey colour, and on microscopic examination showing an unusual type of nephritis.

For very many years the plant had been regarded as a good fodder and animals frequently eat large quantities of the leaves when they fall from the trees towards the end of a dry season.

Eradication of the plant will be very difficult as it is very wide-spread over the area concerned. Besides, it is a plant which coppises, i.e., throws up aerial shoots from the roots at some distance from the parent tree.

Brucellosis.—This disease is wide-spread throughout the dairy districts and is a problem of first importance. Considering the size of the industry, there are very few herds under the brucellosis-free herd scheme. Fortunately, some of these are among the best in the State. Many owners are fully cognisant of the danger involved in the purchase of animals, and in the case of high-priced stock it is becoming the usual practice to buy subject to test.

In the course of the year, more than 15,000 blood samples were submitted to the Animal Health Stations. Whole herds tested one or more times during the year were 108, and 42 of these were free of positive reactors. In most of the other herds, the test and slaughter method gave satisfactory progress

towards the eradication of the disease. However, this method of control has certain disadvantages in heavily infested herds, because—

(1) Such herds must be tested at short intervals and field officers are unable to do this, because of other duties or shortage of labour on the farms.

(2) Owners are often unable to bear the initial loss involved in selling for slaughter all the reactors. However, the present price of beef, together with the lack of man-power on farms, provided the conditions where many owners found it desirable to undertake eradication, particularly where the incidence was not more than 25 per cent. In six herds initial tests showed 30 to 50 per cent. of reactors and owners were unable to proceed with eradication. No attempt has yet been made to vaccinate with Strain 19, although this is now available in Australia. When staff is available it is hoped that some work, even if only to a limited extent, can be undertaken.

Pleuro-pneumonia contagiosa.—Outbreaks of this disease continued to occur everywhere throughout the cattle-raising districts. To cope with these occurrences, the assistance of officers of the Animal Health Division of the Council for Scientific and Industrial Research has been accepted and the complement fixation test has been applied to a large number of animals in the hope of discovering carriers. The outstanding result of these tests has been the surprisingly high number of animals showing evidence of the disease as indicated by the test in comparison with the number showing symptoms. It is this particular characteristic of the disease—i.e., the large number of affected animals which show no evidence, combined with the circumstances under which cattle are maintained in this country, which makes pleuro-pneumonia a particularly difficult condition to control. Added to this is the absence of any power to enforce tests and only where owners are willing to co-operate can any test be applied.

The usual procedure adopted in control is to quarantine and inoculate and then 60 days after the last clinical case has been noted raise the quarantine. It is obvious that such a procedure cannot be satisfactory where there are many affected animals which are not clinical cases.

There were twenty-one officially recorded outbreaks, but this does not represent the total for the disease is enzootic over a large area, and on large properties particularly cases occur which are not detected. Vaccine prepared by the C.S. & I.R. Animal Health Division was used extensively and more than 250,000 cattle vaccinated.

Miscellaneous.—Mastitis is wide-spread throughout the dairying areas, and attempts at control have met with varying success. Some experimental work was carried out with sulphanilamide in oil and other drugs (udder infusions) as recommended by some American authorities, but results were disappointing.

Phosphate deficiency is suspected to be a cause of considerable infertility in dairy cattle in some areas, particularly along the coast. Some animals showed a low serum phosphate, while the addition of a phosphate supplement to the ration appears to have reduced the incidence.

Poisonous plants are very common throughout the State, and the yearly loss in the aggregate among all classes of stock must be considerable. The following plants have come under observation as causes of mortality in the course of the year:—

- Trema aspera*, the poison peach;
- Hoya australis*, the wax flower;
- Passiflora alba*, wild passion vine;
- Lantana camara*; and
- Myoporum deserti*, Ellangowan poison bush.

Bracken fern (*Pteridium aquilinum*) has been suspected on more than one occasion as the cause of mortality among young cattle on the coast.

Arsenical poisoning is, unfortunately, very common among cattle, and in one instance some valuable stud animals were lost.

An unusual mortality among dairy cattle occurred in the Malanda district (N.Q.). Twelve animals died over a period of two weeks. *Post mortem* showed an acute gastro-hæmorrhagic enteritis. Attempts to transmit the disease both by the inoculation of an emulsion of some of the organs, from a field case, and by drenching with bowel contents, appeared to be successful, though further transmission failed. All the cases referred to occurred on the one farm. Bacteriological and chemical investigation failed to reveal the cause of the mortality.

Blackleg is very common and very wide-spread. On many properties vaccination is an annual practice.

Investigations into certain aspects of helminth infestations of the intestinal tract of calves have been commenced, and work is nearly complete on a differentiation of the larvae of the different species. This will lead to further work on the epidemiology and pathogenesis of the different species.

As in other years, outbreaks of helminthiasis among young cattle were reported during winter and spring and particularly heavy losses were recorded in some south coast areas. Several species of parasites were implicated and phenothiazine used for control purposes.

HORSES.

Ataxia.—This condition which has been known to exist in the Bowen district of North Queensland, and was referred to in the last annual report, was again observed. The condition is of some considerable economic importance. A similar condition has been observed in the Bundaberg district, but the identity of the two conditions is still in doubt. Plant poisoning has been suspected.

Mortalities in horses have been reported from the Tullibudgera district of the South Coast. The symptoms noted are progressive, reaching their peak in about two months, when an attack is characterized by distressed breathing and profuse sweating. Attacks usually follow exertion. There is some evidence that the disease is associated with the ingestion of one of the mist weeds, two specimens of which, *Eupatorium adenophorum* and *E. riparium*, occur in the district.

A mortality was noted in the Richmond district, where more than twenty valuable horses died as a result of the ingestion of fibrous plants.

Tetanus is frequent in horses, particularly in the North, and vaccination is now more commonly practised.

SHEEP AND WOOL BRANCH.

The year 1945 has been an adverse one for the sheep industry. Drought conditions prevailed in two-thirds of the pastoral areas; only the North-West had a good season. The present sheep population is approximately 21,000,000. From the appraisal of 533,095 bales of wool the sum of £10,186,698 was realised.

The figures issued by the Government Statistician show that 6,874,000 ewes were mated and 3,117,000 lambs marked, a percentage of 45.3. An interesting feature of the lambings has been the extremely good percentages obtained in the North-West, where many of the flocks were joined in October-November of 1944.

The shortage of fat sheep because of protracted dry weather in the Central-West and South-West, and restriction of stock movements from the North-West has been reflected in the prices at the Brisbane markets. Prime light wethers have been in demand at 5½d. per lb. and special lines of ewes have realised 4½d. per lb. Sucker lambs have reached as high as 10½d. per lb., plus skin value.

The activities of the Branch have included extension and investigational work, as set out below:—

EXTENSION WORK.

Blow Fly Extension Work.—Demonstrations and instruction were given at two special schools, one at Clermont and the other in the Richmond district. The performance of the Mules operation on properties which had not undertaken this work previously has been supervised, and in this way a further twenty-five owners and/or managers have been trained, and 50,000 sheep treated. At present, over 100 flock owners are known to be practising the Mules method as a part of regular station routine, and over one million sheep, most of which are depastured in the central-west, have been treated. Constant follow-up work has been done to determine the results of the operation under field conditions. The consensus of opinion among graziers is that it reduces the incidence of crutch strike by about 90 per cent.

Tailing methods used at lamb-marking time have been examined carefully in some of the breeding areas, and a tendency to cut the tails too long has been observed. The importance of turning the bare skin from the under surface of the tail back over the severed stump is not realised by many flock managers, and more extension work is required to imbue those concerned with the efficiency of this practice.

Sheep Classing.—The classing of flocks of Merinos, Corriedales, and English breeds has received attention, and rams have been selected for flocks and studs. Flock owners who have availed themselves of this service number 38, and over 50,000 sheep have been handled.

Sheep classing is not a routine practice on many properties because of the difficulty of maintaining sheep numbers in adverse seasonal circumstances.

General information on matters pertaining to sheep husbandry was given to all graziers who sought it.

The Farmers' Wool Scheme.—The work of sorting and re-classing wool received under the farmers' wool scheme has continued smoothly throughout the year. In all, 667 bales of wool have been handled and many small clips have been sold at advantageous prices.

DISEASE CONDITIONS.

Malignant Oedema of Wether Lambs.—Severe losses after lambmarking were reported from properties in the North-West in the course of the winter of 1944. Over a dozen properties are known to have been affected with losses up to 50 per cent. Enquiry revealed that over a number of years post marking losses of about 10 per cent. of wether lambs have occurred. Malignant oedema is suspected.

Infectious Labial Dermatitis (Scabby Mouth).—Infectious labial dermatitis occurred extensively throughout the sheep areas. Considerable industrial trouble arose through graziers repeatedly penning affected sheep for shearing and it would appear as though vaccination of all sheep against the disease is the only remedy.

Pregnancy Toxaemia.—After the bountiful February (1944) rains in the Central-West, most graziers considered the season in that area to be assured, and mated their sheep accordingly. The unusual deterioration of the pastures during autumn meant that many ewes were on a rapidly-falling plane of nutrition during the later stages of their pregnancy and heavy losses from pregnancy toxaemia resulted.

PARASITIC CONDITIONS.

Cutaneous Myiasis.—Because of dry conditions in the Central and South-Western Districts, blow flies have not been as bad as in some previous years. Considerable trouble was encountered in the North-West where seasonal conditions were good. There the Mules operation is not well-established and labour shortages made the adoption of reasonable preventive measures difficult.

Pediculosis.—The foot louse of sheep—*Linognathus pedalis*—was reported from widely-distributed places in the Central and North-Western District. Outbreaks were apparently sporadic and usually only one or two sheep on each property were seen to be affected.

Concern is felt over the spread of the body louse—*Bovicola ovis*—into the downs country in Central and North-Western areas. A carefully-planned educational campaign to acquaint graziers with the potential danger of louse spread and more stringent administration of regulations is proposed.

Trombidiosis of Sheep.—A dermatitis of parasitic origin and affecting certain parts of the legs of sheep depastured on the black earths of the Central Highlands was reported last year.

Research work was carried out in association with officers of the Council for Scientific and Industrial Research on the occurrence and control of the condition, and the causative mite *Trombicula sarcina* has been studied. Nymphal stages have been recovered from soil experimentally infested with engorged larvae. The nymphs were seen 13-16 days after engorgement of the larvae. Initial experiments indicate that *di-butyl-phthalate* promises well as a control agent.

Epidemiology Surveys.—The epidemiology surveys which are being conducted in conjunction with the Council for Scientific and Industrial Research at the McMaster Laboratory are still in progress. Seasonal variations in the worm burdens have been studied in the areas where haemonchosis, trichostrongylosis and oesophagostomiasis occur. The data so far collected indicates that while *Haemonchus contortus* is far more prevalent during summer, the severity of outbreaks is dependent on the incidence of suitable weather conditions.

Trichostrongylosis and oesophagostomiasis are essentially winter complaints, but the occurrence of outbreaks is governed by rainfall. This work is of a long range nature and is expected to continue.

Diseases related to Toxic Substances—Fluorosis.—Further survey work to define the areas of the State where stock suffer from chronic endemic dental fluorosis as the result of drinking bore water containing fluorine has been undertaken. Investigations have been confined chiefly to the Central-West and have consisted of the examination of sheep for clinical signs of fluorosis, a determination of the economic importance of the condition and the collection of water samples for confirmatory evidence.

Three large belts of country, where fluorinised bores are found, are known to occur.

Fluorosis is of considerable importance in that the majority of bores known to be affected are in some of the most important breeding areas, and sheep are being subjected to a regular fluorine intake during the critical period of enamel deposition.

Poison Plants.—Several mortalities from hungry animals eating poison plants came to notice. In some cases heavy losses were recorded, especially from *Gastrolobium grandiflora* and *Threlkeldia proceriflora*.

POULTRY BRANCH.

Production.—The restricted supply of eggs for ordinary distribution has not been because of a decrease in production, but because of the demands of the Services. In measuring production in past years, the quantity marketed by the

Queensland Egg Board has been used. Although the final figures are not available, there is every indication that the eggs received by the Board will exceed nine million dozen for the year—an all-time record of production within the controlled area. This has been brought about by expansion on existing poultry farms, as an increased side-line activity in other rural industries, and by persons engaged in occupations other than rural industries.

Much of the activity was a result of the call made for increased production, but there is no doubt that the relatively good price obtainable for eggs and table poultry, and a more or less stabilized food cost has contributed, in no small way, to this increase. Inability of householders at times to obtain their requirements forced them to increase their backyard flocks, thereby decreasing the demand for eggs from the small (formerly uncontrolled) producer, with a consequent diversion of eggs through the usual marketing channels.

In pre-war days, the Queensland Egg Board could find markets within the State for approximately three-fifths of the eggs received by that organization, viz.: about five million dozen. Finding of markets for the surplus beyond ordinary requirements in the post-war period may prove a heavy responsibility for the Board, but it is anticipated that for at least some years reasonable export values will operate.

Poultry Food Supply.—The cost of poultry food throughout the year has been stable; but feed has not been available in either quantity or quality for economic production, with the result that the output per bird has been lower than in normal years.

For the first half of the year protein-rich foods were particularly scarce and cereals not in ample supply. It is during this portion of the year that most of the hatching within the State is done and the heaviest demand for food made. The shortage of protein for growing stock had a serious effect on their development, resulting in increased mortality and the raising of many birds unsuited to sustained production.

With the object of demonstrating the unsoundness of feeding poultry on rations deficient in animal protein, the National Utility Poultry Breeders' Association, in co-operation with officers of this department, conducted at its Zillmere farm an experiment in which 150 pullets approximately six weeks of age were used. They were divided into three groups, group 1 being fed on ground grain; group 2, ground grain plus bone meal; group 3, ground grains plus meat meal. The protein contents of the rations were as follows:—

Group 1.	Group 2.	Group 3.
11.1 per cent.	11.9 per cent.	15.5 per cent.
Gains in weight over a period of 12½ weeks were—		
9.8 oz.	11.6 oz.	26.8 oz.

Commencing with the second half of the year, the cereal position became acute and merchants were unable to supply the requirements of the industry. One of the largest firms was only able to supply farmers with two-thirds of the previous year's purchases, causing chaotic conditions and bringing about a considerable fall in table poultry values; in fact, farmers were unable to obtain buyers through usual marketing methods and were forced to dispose of birds at any price offered. It has been reported that hundreds of birds were destroyed and buried. Low values continued until early in April, when a co-operative organization commenced dressing for Service requirements with the result of an improvement in values.

Although the quality of fodder has improved the quantity has not and there appears to be every indication of a considerably reduced hatching period for the coming year.

Slaughtering of Poultry.—Regulations governing the slaughter of poultry were introduced in July, 1941. These regulations were framed with the object of ensuring the hygienic slaughter of poultry. A survey of the position then made revealed that there were 37 operators engaged in the slaughter of poultry within the Greater Brisbane area. On the completion of the survey, Japan had entered the war and difficulties of material and labour supply made it impossible to bring the various establishments up to the desired standard. The material position during the present year showed some improvement and an effort was again made to take some action, but this attempt had to be abandoned because of the feed position enforcing abnormal slaughter of poultry.

Slaughter of poultry is engaged in by many in a small way, by others on a relatively large scale. During the last half of this year, at one establishment up to 150,000 birds were treated, and at two others approximately 70,000 and 40,000 respectively. The last-mentioned were slaughtered over a period of three months. These three establishments have probably dealt with half of the birds slaughtered. The quantity of poultry slaughtered appears to justify the establishment of an organization within the industry, in order that both the producer and the consumer may be protected during glut periods.

Sex-determination of Chickens.—In the course of the year, numerous examinations of persons who had studied this

subject were conducted, but only six obtained a pass of 90 per cent. or over—the minimum standard for which a licence is issued. Thirty-two persons were licensed to determine the sex of chickens in the course of the year. Fodder supplies were plentiful during the early portion of the hatching period and the sex of a greater number of chickens than in any previous year (2 million) was determined, many farmers making a speciality of rearing cockerel chickens for table purposes. The number sexed was furnished by 19 sexers; the remainder of those licensed (13) may not have handled, on an average, the same number of chickens.

Registration of Hatcheries.—In the course of the year, 123 farmers applied for registration. Twelve were rejected because of unsuitability of stock and general farm equipment. It is believed that the system of registration is of considerable importance in raising the quality of stock.

DISEASE CONTROL.

Pullorum Disease.—Birds numbering 128,000 were tested by the field staff for pullorum disease, with a percentage of 3.4 reactors. In 19 hatcheries there were no reactors, and in 20 others the percentage was less than 1. In addition, 14,000 tests were carried out for farmers on birds used for breeding purposes. In these there were 6.1 per cent. reactors.

In the hatching season, July to December, 1944, 74 lots of young chickens were examined bacteriologically and pullorum disease was diagnosed in 39. There was a big increase in the number of chickens hatched during the season and this contributed to the increased number of cases of pullorum disease diagnosed. Most cases of the disease occurred in chicks hatched from flocks in which eradication by blood testing was either not attempted or undertaken without the necessary thoroughness.

Examination of chickens from registered flocks being tested under the departmental scheme showed that satisfactory control of pullorum disease is being achieved in these flocks.

Coccidiosis.—Several factors contributed to an increase in the number and severity of outbreaks of coccidiosis in chickens 2 to 4 months' old. More chickens were reared than in previous years, and on many farms the accommodation was unsatisfactory, or the owners, being new to the industry, were unaware of hygienic measures which must be adopted to control this disease. Both caecal coccidiosis (*Eimeria tenella*) and intestinal coccidiosis (*E. necatrix*) were common.

Nutritional Deficiencies in Chickens.—Wartime shortages of various ingredients (meat and dried milk products) of poultry rations resulted in many nutritional deficiencies coming under notice. Deficiency of protein of animal origin was not uncommon in growing chickens; vitamin A deficiency also was common. Deficiency of vitamins of the B complex also came to notice in young chickens. Nutritional troubles caused considerable loss to the poultry industry and probably increased the severity of many outbreaks of coccidiosis and respiratory infections. There is a need for biochemical investigation and feeding experiments to be done with the rations used for poultry in Queensland.

Respiratory Infections.—Some infections of the respiratory tract (commonly called "roup" by poultry farmers) are now recognised as disease entities, but little research has been done to determine which of these occur in Queensland.

Fowl pox is widespread in commercial flocks, but vaccination has not been extensively used as a control measure. Field trials on vaccination in commercial flocks and laboratory investigations on the preparation of efficient vaccines seem desirable. Fowl pox causes serious losses in turkeys in Southern Queensland, at least, and in this species also vaccination trials would be worthwhile.

An infection of chickens 10 to 16 weeks old and characterised by catarrh of the nasal cavities and sinuses and sometimes tracheitis, was common during the 1944 rearing season. The morbidity was high, but mortality was low in the absence of complications such as coccidiosis and nutritional deficiency. Some investigation of this disease was undertaken, but shortage of staff and facilities hampered the work. Under experimental conditions the disease was reproduced by intra-tracheal inoculation of exudate from the trachea of affected birds. Birds which had recovered from the disease were susceptible to a strain of infectious laryngo-tracheitis virus obtained from the New South Wales Department of Agriculture. The disease under investigation has been commonly called infectious catarrh in Australia, but it would seem more correct to call it infectious bronchitis, the aetiology of which has been determined in America. Work on the problem is proceeding.

Infectious laryngo-tracheitis is a common cause of serious loss in poultry in New South Wales and Victoria, and it is important to determine whether it occurs in Queensland. If so, it can be efficiently controlled by vaccination. The acute type of the disease has not come to notice, but some of the outbreaks of the type described in the preceding paragraph may be caused by the I.L.T. virus and the matter calls for investigation.

Fowl Cholera.—On a farm in the Brisbane district, respiratory disease complicated by disease of the central nervous system was investigated several times in the course of the year. Fowl pox and vitamin A deficiency caused much mortality in this flock, but in addition the fowl cholera bacillus (*Pasteurella aviseptica*) was present and commonly caused abscesses, oedema of the wattles, and inflammation of the air sacs and nasal cavities. In some cases the organism spread to the meninges and the brain producing symptoms of meningitis. At one period, the fowl cholera bacillus alone was responsible for cases of inflammation of the nasal cavities and sinuses and the brain. These birds showed coryza and peculiar head and neck movements and eventually became comatose and died. Fowl cholera can be controlled only by flock management and hygienic procedures.

Several outbreaks of fowl cholera in ducklings were diagnosed.

Fowl cholera was the cause of heavy mortality in turkeys on the Darling Downs.

Avian Leucosis Complex.—The various manifestations of this disease are the commonest cause of mortality and culling in adult fowls.

Spirochaetosis.—Several outbreaks of this disease were met with in various parts of the State.

Parasites.—From departmental experience in this and in past years, it is evident that little is being done to overcome the losses caused by worms and external parasites. Heavy infestations of *Ascaridia galli* and tapeworms are seen much too frequently.

An interesting parasite of pigeons, new to Australia, was recently encountered. This was the pigeon fly, *Pseudolynchia canariensis*. This hippoboscid is a blood sucker and in other countries is the cause of serious losses. It is also a vector of pigeon malaria, *Haemoproteus columbae*.

Ants.—Mortalities among birds, associated with the ingestion of large numbers of *Monomorium rothschildi* were reported on two occasions. The ants were mainly winged forms. Previously the green head, *Chalcoxonura metallica*, and meat ant, *Iridomyrmex detectus*, were implicated in poultry mortalities in this State.

Stick-fast Flea Control.—During the first half of the year the programme of work commenced in 1943 was continued, but in the second half of the year it had to be curtailed because of more urgent work. The reduction of the staff engaged in this work has caused a slackening in eradication practices, but control has been maintained and although the flea has been located on a few additional properties within the area, it has been confined to the district of origin and some considerable progress has been made with the cleaning up of properties. A total of 263 properties has been quarantined within the area. Properties quarantined numbering 172 are now apparently clean, but as dogs and cats are carriers of the pest, clean properties become readily reinfested; and in view of the fact that poultry are only raised as a sideline by most of those owning poultry within the area, complete eradication without very stringent control measures will be almost impracticable. An early lifting of quarantine on apparently clean properties cannot be made because of the necessity for allowing a period to pass for the hatching and development of the flea from the egg stage, but it is expected that in the near future it will be possible to remove quarantine from about 50 properties.

General.—In addition to pullorum testing of breeding flocks, every effort has been made to assist farmers in the culling of their flocks, made necessary to a greater extent than ever by the acute food shortage.

The entry into the industry of persons who had no previous experience has made a heavy call on instructional services, as have also enquiries in connection with releases from the Forces, and material and fodder requirements of those engaged in the industry.

Two permanent and one temporary inspector have been appointed to the poultry staff, but the services of one were not available in this section, as he could not be released from the position then occupied. Of a total staff of nine, four were occupied in the stick-fast flea control.

It is expected that in the coming year it will be possible to so organize the work to permit of the stationing of officers in North Queensland, Central Queensland, and on the Darling Downs. The need for distribution of staff has been demonstrated by a census necessitated by the rationing of poultry foods. This census disclosed that of poultry raised for commercial purposes, 14 per cent. were in the Far North, 10 per cent. in Central Queensland, 10 per cent. on the Darling Downs, and 66 per cent. in the Brisbane area.

PIG BRANCH.

Prices.—The continuance of the *Pig Meats Acquisition Plan* of the Federal Department of Commerce and Agriculture whereby producers are guaranteed 9d. per lb. at export port for first-quality baconers within the range of 100 to 200 lb. dressed weight, and no withdrawal of the guarantee to take

place without twelve months' notice, has given stability to the industry and has also given an incentive for increased production. Unfortunately, the shortage of grain and protein supplements, especially during the latter half of this year, has prevented the desired increase.

Originally, when the pig meat plan was introduced, a total ban was imposed on the slaughtering of porker pigs of less than 100 lb. carcass weight, but this was subsequently modified to the extent that pig carcasses of export quality within the range of 82 to 100 lb. were accepted for export. The price of such pigs, however, was fixed at 1d. less than for baconers in order to create an inducement to produce the heavier type pig.

On the 11th June, 1945, in consequence of the shortage of feeding stuffs, especially grain, throughout Australia, the plan was further modified to allow pigs as light as 60 lb. dressed to be marketed, the price of such pigs to be 9d. per lb. dressed, the same as for heavier pigs. Thus at present prime first quality pigs dressing from 60 to 200 lb. are guaranteed a price of 9d. per lb.

In connection with the plan, it is felt that the time has come when it would be in the interest of the pig industry as a whole to enforce a stricter grading system and payment on a basis of grade.

Stud Pig Breeding.—Reports indicate there has been a large demand for stud pigs and breeders are making every effort to obtain fresh blood lines, in order to maintain and improve the quality of their pigs. In this respect, pig breeders in general are looking forward to the forthcoming Royal National Livestock Show, when opportunity will be given to exhibitors to compare their stock after a recess of about four years. Such a show will also give pig raisers an opportunity to obtain good breeding stock.

General Instructional Work.—The correspondence course of instruction in pig-raising continues to serve its useful purpose in providing instruction over a period of months to many farmers and others whom it is impracticable to meet in person. Twenty-five more students completed the course during the year, making a total of 490 who have completed the whole course.

Field days, lantern lectures, generally followed by farm visits, were held in various centres, but because of lack of staff this work had to be considerably curtailed.

Several visits to bacon factories were organised with a view to educating the farmer as to the type of pig and carcass conformation required for present day markets. A visit to the Animal Health Station, Yeerongpilly, also was included in the programme, where veterinary officers gave *post mortem* demonstrations, lectures, and general advice on disease. A question period gave farmers further opportunity of acquiring information on many problems encountered on their own farms. The attendance at these demonstrations was remarkably good, and success was doubly assured by the fact that many of the farmers sent their own pigs, and thus were able to check on their breeding and feeding methods and obtain first-hand information as to remedial measures.

Despite the problems of the industry to-day, chief of which are the shortage of food, manpower, and materials, there are more pig-raisers seeking advice on various phases of the industry than hitherto.

DISEASE CONTROL.

Tuberculosis.—This is very common in the State and is the cause of much economic loss. Figures under the return of animals slaughtered shown in another part of this report, indicate that 0.72 per cent. of the animals were condemned entirely for this disease. The value of the condemned animals if healthy, would be, in the aggregate, very high.

The source of infection is mostly the dairy cow on the farm, but there has been one instance where pigs fed on slaughter-house offal and having no contact with cattle showed a high incidence. The animals in this piggery were subjected to the single intradermal test, and out of 64, no fewer than 40 reacted. Animal inoculation showed the organism to be of the bovine type. All animals showed lesions on *post mortem*. A second test carried out three months later, and covering 32 animals, 18 of which were in the piggery at the time of the first test and were negative at that test, produced eight more reactors among these originally negative animals. Among the 14 pigs added to the piggery since the test, four reacted.

Erysipelas.—Only one case was diagnosed during the year. This occurred on a property on which the disease had been previously diagnosed. The disease has now been diagnosed on three properties in the State. Only the arthritic form of the disease has been seen. A survey to determine the extent and type of infection is necessary, as the condition can easily become one of serious economic importance.

Brucellosis.—Sixteen herds have been tested by the agglutination test. Selected pigs only have been tested on other properties, and in one of these, a heavy infection was found. Of the whole herds tested five showed some infection. Satisfactory control was achieved by regular testing.

This year for the first time the Royal National Association decided to admit no pig to its annual show unless it had come from a brucellosis free piggery, or when not so, that it had been recently tested and found negative. This work involved much extra work for the staff.

Salmonella Infection.—Pneumonia due to *Salmonella cholerae suis* is the commonest infectious disease of pigs encountered in the field. The septicaemic form of the infection (paratyphoid) caused some concern at bacon factories, because *S. cholerae suis* is known to be pathogenic to man. A number of specimens have been submitted from bacon factories for bacteriological examination. There is a need to extend such work, so that meat inspectors' judgment on paratyphoid can be soundly based and correlated with bacteriological findings.

Two outbreaks of acute polyarthritis due to *Salmonella cholerae suis* were diagnosed.

Specimens from a heavy mortality following vaccination with mixed swine plague vaccine (Australian) were examined. Infection with *Clostridium septique* and *Salmonella cholerae suis* had apparently occurred at the site of inoculation and produced a haemorrhagic cellulitis and septicaemia.

Mortalities from Eating Caterpillars.—Mortalities among pigs associated with eating the caterpillars of a butterfly, *Anaphaeis java tentonia*, were reported from Mundubbera. This butterfly breeds on Capparis spp.—in this case *C. Mitchellii*. The larvae of allied species of butterflies have been recorded as poisonous to stock in other countries.

BRANDS.

Details of Registrations and Transfers for Year 1944-45.

	Number.	Fees Received.	Number Since Inception of Legislation.
		£ s. d.	
Three Piece Ordinary Horse and Cattle Brands Registered	574	574 0 0	91,623
Cancelled Horse and Cattle Brands Registered	352	1,056 0 0	8,226
Horse and Cattle Symbol Brands Registered	87	652 10 0	1,987
Cattle Earmarks Registered	633	633 0 0	20,844
Horse and Cattle Brands Transferred	1,824	912 0 0	65,029
Sheep Brands and Earmarks Registered	78	50 15 0	13,425
Sheep Brands and Earmarks Transferred	171	42 15 0	7,279
Distinctive Brands Registered	16	No Fee	1,280
Alteration of Address of Brands	265	No Fee	..
Brands Cancelled	9	No Fee	..
Earmarks Cancelled	136	No Fee	..
		£3,921 0 0	

There has been an increase in the number of registrations of cancelled brands, symbol brands, distinctive brands and transfers of horse and cattle brands, and sheep brands and earmarks, and a decrease in the registrations of ordinary horse and cattle brands and cattle earmarks, compared with the figures for 1943-44.

The fees collected were £99 5s. in excess of those for the previous year.

The figures quoted above are highly satisfactory, considering the effect of the war on the pastoral industry.

A close inspection of the brands and earmarks of stock arriving at Cannon Hill saleyards has been maintained, and action taken in connection with any irregularities.

As previously reported, carelessness is the main cause of many of the irregularities. Owners, in their own interests, should see that earmarking of their cattle is done properly with pliers and on the correct positions allotted to them.

Because of the exigencies of war, the *Horse and Cattle Brands Directory* has not been published for four years, but the *Directory*, which will be complete to the end of 1944, is now in the hands of the Government Printer. As the revised edition will cover four years' registrations, transfers, and alterations, the *Directory* will be published later in the year than usual.

The revised edition of the *Sheep Brands and Earmarks Directory* has been published.

SLAUGHTERING OF STOCK.

The control of the slaughtering of stock for local consumption is vested in the *Slaughtering Act and Regulations*. Some inspectors are engaged in the administration of this Act as full time officers, while some are partly engaged.

Generally, the standard of inspection is kept high, although it is difficult in outlying places and indeed even in the larger centres where cattle are killed at a number of widely separated points, to maintain as high a standard of inspection as would be desirable. It is considered that in the

large towns a centrally situated abattoir under local authority control would seem a necessity. It would certainly lead to a much greater efficiency in respect of inspection and would probably be much more economical from the point of view of the butchers themselves, as well as greatly improving the hygiene. Old types of slaughter houses are still in operation around some of the larger towns.

Necessary maintenance repairs to slaughter-yards, butcher shops and conveyances have been to some extent neglected, because of the acute shortage of both materials and labour, while the erection of new premises has been practically prohibited.

There were eleven prosecutions under the *Slaughtering Act and Regulations*.

Bacon Factories.—In the course of the year, a total of 397,566 pigs were slaughtered in the bacon factories. Of these, 30,709 were directed for export. In addition for canning purposes, 40,214 cattle, 15,840 calves, and 27,557 sheep were slaughtered at bacon factories.

A total of 2,872 (0.72 per cent.) carcasses of swine were totally condemned for tuberculosis. The value of these animals, if healthy, would be very considerable. In addition there were 8,604 partial condemnations (2.1 per cent.).

SUMMARY OF STOCK SLAUGHTERED.

The following figures show the total stock killed for local consumption (excluding those for export and others killed on the farms and stations, of which there is no record):—

Inspector.	Bullocks.	Cows.	Calves.	Sheep.	Swine.
Bacon Factories	18,014	22,200	15,840	27,551	366,857
Brisbane Abattoir	39,228	66,572	87,343	763,065	3,883
Department Inspectors ..	52,162	66,142	19,571	361,490	15,514
Acting Inspectors (Police, &c.)	27,824	33,664	15,551	131,099	2,970
Totals	137,228	188,578	138,305	1,283,205	389,224

In addition, a further 89,300 pigs were slaughtered in meatworks under the control of the Federal Commerce Department inspectors. Some of these pigs were exported, some went into local consumption and others interstate.

FEDERAL QUARANTINE.

The duties carried out under the *Federal Quarantine Act* have been continued satisfactorily. Because of the very large number of overseas ships calling at the ports along the eastern seaboard of Australia, the possibility of the entry of certain infectious diseases has to be particularly guarded against. The Queensland portion of this seaboard is of special significance.

Officers have made careful inspection of many ships and have received much assistance from Customs officers in these duties. In all cases where prohibited animals or birds have been found they have been seized and destroyed, while in many instances where animals subject to bond have been found, and where the shipmasters have refused to bond, seizure and destruction have been the result.

The following animals were bonded:—

Dogs	163	Monkeys	18
Cats	295	Rabbits	1
Birds	49	Guinea Pigs	3

The following were seized and destroyed:—

Dogs	43	Swine	1
Cats	14	Birds	6
Goats	8	Monkeys	1

On several occasions dogs which had died on board ship in port were examined for the possibility of rabies, but always with negative results.

INTERSTATE TRAFFIC.

The following figures show the number of stock which crossed the borders to and from neighbouring territory:—

Northern Territory to Queensland—

67,293 mainly store cattle.

New South Wales from Queensland—

Fat Cattle	115,500	Store Sheep	456,646
Store Cattle	104,739	Pigs	15,934
Fat Sheep	106,717	(for slaughter)	

LIVE STOCK STATISTICS.

The latest figures available show the number of live stock in the State as—

Horses	350,670	Sheep	21,267,601
Cattle	6,621,499	Swine	438,088

Sheep population has again declined; horses, cattle and swine remained practically stable.

JOHN LEGG,

Acting Director, Division of Animal Industry.

REPORT OF THE DIRECTOR OF DAIRYING.

SEASONAL CONDITIONS.

In the dairying districts seasonal conditions were variable. Growth of pastures and fodder crops in most districts responded well to useful rains in July, and, despite dry weather in August and September, production rose steadily. Normal increase in late spring did not occur as October and November also were dry months. Production was relatively good in the summer, in some districts, but below normal elsewhere. Except in the immediate coastal strip from the New South Wales Border to Gympie, adverse conditions prevailed during autumn. However, soaking rains later in June greatly improved present seasonal prospects.

BUTTER PRODUCTION AND QUALITY.

Butter production was 95,005,539 lb., valued at approximately £6,498,289. The chief causes of a lower butter output were adverse seasonal conditions, together with the cumulative effects of the other disabilities under which the dairy industry had been carried on in the war years—such as labour shortage for the milking shed and, more particularly for the growth and conservation of fodder, lack of machinery and essential equipment. The considerable diversion of supplies to the liquid milk market and cheese production in recent years has also been almost entirely at the expense of butter production.

The Commonwealth Government increased the amount of subsidy paid to the dairy industry by way of a special seasonal subsidy from May to August, 1945, inclusive, at the rate of 2d. per lb. commercial butter equivalent and at the rate of 1d. per lb. for the months of September and October, 1945.

The price (including Commonwealth subsidy) returned to factories by the Commonwealth Dairy Produce Equalisation Committee Ltd. was 1s. 8.95d. per lb. commercial butter, against 1s. 8.21d. per lb. in 1943-44.

Butter examined officially by the Commonwealth and State grading staffs was classified into the following grades:—Choice, 578,796 boxes (45.37 per cent.); first, 604,568 boxes (47.4 per cent.); second, 83,295 boxes (6.53 per cent.); pastry, 8,971 boxes (.7 per cent.).

These figures indicate a downward trend, no doubt accounted for by the difficulties already referred to. When normal trading is resumed the exportable surplus of butter from Australia will have to meet again the competition of the uniformly high-quality butter from other countries and of butter substitutes. Inferior produce may then only be marketable at a reduced price. The necessity for serious thought and resolute action by all engaged in the dairy industry is thus indicated in order to ensure that Australian butter can compete on a quality basis on the world's market.

CHEESE PRODUCTION AND QUALITY.

Cheese production was 22,627,225 lb., valued at approximately £1,100,000, compared with 24,041,648 lb., valued at £1,159,250 for the previous year. The cheese production goal was achieved.

There was a slight diversion of milk from cheese to butter manufacture but the favourable price relationship of cheese factory to butter factory pays tended towards stabilising cheese factory supplies. The main factor governing slightly lower cheese output was seasonal conditions.

Of all cheese graded officially, 72.6 per cent. was classed as of choice and first quality; 26.39 per cent. second grade; and 1.01 per cent. third grade; as against 75.65 per cent., 24.33 per cent., and .02 per cent. respectively, in the previous year.

The cheese field staff made 150 factory visits and completed about 20,000 individual tests on milk supplies and at factories. Several factories have now adopted the use of refrigeration for cooling the cheese-holding rooms. The system of payment of differential rates for milk according to hygienic quality adopted by several associations in recent years has resulted in an improvement in the quality of cheese produced by such factories, and all of these progressive associations are in the forefront as regards quality of product.

Bacteriophage has been very prevalent, causing much inconvenience in cheese manufacture in some factories. In order to carry out investigations on a factory scale into the control of this problem, a starter room, isolated from the factory itself, has been erected at the Yargullen factory. Technical advice on methods of minimising the effects of bacteriophage in cheese factories is being made available.

Difficulties with rennet strength were experienced in some factories. A survey of rennet quality was made and full co-operation was received from manufacturers in rectifying any anomalies and the difficulties encountered early in the season have since been overcome.

Investigations on the production of cheese from homogenised milk were continued, and, following successful operations on a commercial scale, the Murgon factory has now installed complete plant for commercial production. The assistance of the Queensland Butter Board and the co-operation of the management and staff of the South Burnett Co-operative Association in this work are much appreciated. This product, which does not exude fat when kept at high temperatures, possesses promise for use in tropical climates.

The use of calcium chloride for improving the body and texture of cheese in certain circumstances has proved successful; further investigations are proceeding.

LIQUID MILK TRADE.

The increasing quantity of milk consumed in recent years is regarded as a desirable trend in the dairy industry, both from the viewpoint of stabilizing the industry and the improvement of nutritional standards. There is an increasing number of dairy factory plants which are being equipped for the pasteurisation and/or chilling of milk. This phase of dairy factory activities has assisted materially in ensuring adequate milk supplies for the Army and other purposes in some districts, and in the post-war years should prove of benefit in ensuring safe and high-quality milk for country towns. Milk pasteurisation plants are now in operation in twelve country towns.

The handling of milk from producers at central depots enables a close scrutiny of bacterial and chemical quality to be made and opens the way for an active instructional campaign for the improvement of any supplies found by recognised platform quality tests to require a higher standard. This part of the work of the division should become of still greater importance.

GENERAL.

The supply position for equipment and machinery for dairy farming has shown a marked improvement and, although Army releases have tended to ease the labour position, farmers generally are still handicapped by shortage of labour.

Transport control by the Cream Transport Committee, in conjunction with the Commonwealth Liquid Fuel Control Board, has conserved trucks, fuel, rubber and spare parts, while at the same time ensuring the continuance of efficient transport of milk and cream from farms to factories.

During the year, 450 purebred dairy cows were tested under the Australian Purebred Herd Recording Scheme for entry into the advanced register of the respective breed societies. Of these, 278 cows qualified for entry, 112 failed to attain the production standards and 60 were withdrawn from test. Details are given below:—

Breed.	Passed.	Failed.	Total.
Australian Illawarra Shorthorn ..	129	42	171
Jersey	181	41	172
Ayrshire	6	26	32
Guernsey	12	3	15
Total	278	112	390

The number of herds submitted under the grade herd testing scheme was 55, comprising 2,070 cows and necessitating 5,207 tests.

Farmers were assisted under the rail rebate scheme on purebred bulls in respect of 81 animals, the total amount of freight refunded being £311 16s. 11d. Values of dairy stock were well maintained throughout the year.

In the annual examinations for certificates of proficiency under the *Dairy Produce Acts* 122 candidates presented themselves, the number for the respective subjects being—Milk and cream testing, 59; milk and cream grading, 44; butter-making, 12; cheesemaking, 7.

The division was active in its contributions to *The Queensland Agricultural Journal*, a total of 22 papers being written by members of the staff. The full range of advisory literature on both the production and manufacturing sides of dairying now available for distribution is freely availed of by farmers and factory operatives. Papers were also contributed to the annual conference of the Australian Dairy Factory Managers' Institute and other organisations. Lantern lectures and field days were conducted at many centres. In co-operation with the Editor of Publications, material was provided for a series of 30 talks through commercial (regional) broadcasting stations on dairy production.

The activities of the division were expanded by the inauguration of a dairy machinery advisory service, whereby demonstrations on the use, care and upkeep of dairy machinery

(chiefly separators and milking machines) were given periodically in dairying centres. This service is highly appreciated by producers.

The division co-operated with the Army Inventions Directorate in investigating the use of equipment designed for dairy farms.

A considerable amount of work was involved on various committees, such as Cream Transport Committee, Milk Prices Advisory Committee, Milk Tribunal, Queensland Cheese Board, and the State Dairy Industry Advisory Committee. The division continued to act on behalf of the Federal Dairy Produce Controller in administering the provisions of the *Cream (Disposal and Use) Order*.

As in recent years officers were responsible for many extra-neous duties imposed by wartime agricultural organisation, and these additional duties were again performed willingly in the year under review.

DAIRY RESEARCH BRANCH.

The staffs of the laboratories at Brisbane, Hamilton and Toowoomba conducted experiments and investigations on matters of practical importance to the industry, and also performed the control work necessary to ensure the maintenance of a satisfactory standard of quality of the various products.

The amount of work performed is indicated to some extent by the following figures, which, however, do not include work done in the research projects undertaken:—

	Tests.
Brisbane Laboratory and Milk Depots	100,155
Hamilton Laboratory	24,800
Toowoomba (Laboratory and Cheese Factories) ..	20,000
Total	144,955

MILK.

The control of the quality of milk deliveries in Brisbane for Milk Board purposes has been a function of the Dairy Research Laboratory. Samples numbering 14,234 were examined in the laboratory by 17,000 tests, and at the depots 47,288 samples involved 81,455 tests.

Brisbane consumed milk at the rate of 30,000 gallons a day, which represents a daily per capita consumption of 0.76 pints. It is found that 47 per cent. of Brisbane's milk is consumed as bottled pasteurised milk and 8 per cent. as bulk pasteurised or processed milk. Altogether, 1,172 samples of pasteurised milk were examined in Brisbane and the quality was found to be satisfactory. The average fat content of the pasteurised milk was 3.99 per cent. The efficiency of pasteurisation was checked by means of the phosphatase test, and found to be highly satisfactory.

In Toowoomba and Warwick, the milk supplies, both raw and pasteurised, were given similar supervision by the staff stationed in Toowoomba.

In this milk control work there has been excellent co-operation among the laboratory staff, field officers and depot personnel. Farmers were advised in regard to their supplies, with suggestions for overcoming observed defects. This milk advisory work is appreciated by the industry.

During the year, research work has been done on milk quality, and studies have been particularly directed to (a) the transport of milk in relation to time and temperature factors; (b) the effect of utensils on quality; (c) the pasteurisability of milk; (d) the microscopic appearance of milk and types of bacteria causing milk contamination.

BUTTER.

The Butter Improvement Service has completed its fifth year. An aggregate of 3,546 samples of butter from all factories were examined by 24,800 bacteriological and chemical tests at the Hamilton and Brisbane laboratories. Reports were sent promptly to factory managers and field officers, who followed up the advice given, and were able to improve quality and rectify any defects in composition.

The following table gives the bacteriological quality index figures for Queensland butter factories for the five years:—

Quarter.	1940-41.	1941-42.	1942-43.	1943-44.	1944-45.
July-September	222	298	299	277	236
October-December	177	224	241	245	256
January-March	171	246	248	235	239
April-June	257	272	243	259	235

It may be noted from the table that the bacteriological quality of the butter is on the upward trend again, following

the slight depreciation in quality which was noticeable during the preceding twelve months (viz., April, 1943, to March, 1944). The composition of the butter is indicated in the following table:—

Average annual moisture	15.40 per cent.
Average annual salt	1.39 per cent.

From these figures it is found that the farmers of Queensland are £27,620 per annum better off than they were five years ago, as a result of improved butter composition. Over the five years, the improvement in composition represents a sum of £124,000 more than would have been received if the composition had remained as it was in 1939-40.

Butter factories were given service by visits from laboratory and field officers, when bacteriological and chemical surveys were made.

Chemical-engineering surveys were made of ten butter factories, following which comprehensive reports covering salient engineering features were sent to managers. These surveys are regarded favourably by the industry, and managers are now seeking more advice on their engineering problems. Complete layout plans of all factories visited have been drawn and details of plant recorded so as to facilitate the elucidation of problems that may arise in the future.

CHEESE.

The cheese industry has received valuable service from both the Toowoomba and Brisbane laboratories. From Toowoomba the laboratory and field officers have visited cheese factories and farms for the purpose of improving quality. Altogether 150 visits were made to cheese factories. Investigations have been continued concerning bacteriophage and an experimental "isolated starter building" has been erected at Yargullen. Four factories submitted 14 samples for examination for "phage" which was found in seven of them. One factory reported that it had successfully controlled bacteriophage by rotation of cultures, which procedure has been recommended to factories. Altogether 875 starters (lactic and cultures) were forwarded to cheese factories from Brisbane in the course of the year.

Investigations were carried out on rennet used in the various factories following the finding of some unsatisfactory stocks, and it was found that most of the trouble was caused by deterioration of aged rennets which had been held in reserve over the war years.

The problem of manufacturing homogenised cheese on a commercial scale was discussed at a special meeting of technologists in the course of the year, and equipment is now ready for further trials at Murgon factory of the South Burnett Co-operative Dairy Association.

Experiments have also been performed on (a) the neutralisation of night's milk for cheese making; (b) field tests for the detection of abnormal milk which affects cheese quality; and (c) on the addition of calcium salts to milk for improving the body of the cheese.

FARM PROBLEMS.

In addition to the investigations on milk quality problems, attention was given the following projects:—

Charcoal coolers, for the holding of cream, used in the Wowan district, were fully investigated and their efficiency and practicability determined. A full technical report on this investigation has been submitted for publication and an article on the subject for the information of farmers was published in the *Queensland Agricultural Journal*.

Experiments were also initiated on the cooling of milk by evaporative cooling methods on farms in the Beaudesert district, and these experiments will continue throughout a twelve-month period.

Field officers on the Darling Downs have also made a survey of the cooling of milk on farms supplying milk for cheese factories and have submitted a report for publication.

ADVISORY WORK.

All sections of the Dairy Research Branch have had a busy year with their advisory and extension duties. Field days, lectures, farm and factory visits, correspondence and publication of articles in the *Queensland Agricultural Journal* have all contributed to the raising of the quality of dairy products.

E. B. RICE, Director of Dairying.

REPORT OF THE DIRECTOR OF THE DIVISION OF MARKETING.

In accordance with the provisions of *The Primary Producers' Organisation and Marketing Acts, 1926 to 1941*, I have the honour to submit herewith my annual report for the year ended 30th June, 1945.

Towards the end of the period under review a Division of Marketing was established within the Department as part of a departmental reorganisation. The Division of Marketing comprises the Marketing and Standards Branches. War-time emergencies have continued to make demands on the time of the staff of both branches, notably in the administration of subsidy and rationing schemes for feeding grains and concentrates for live stock.

The marketing boards, the activities of which are hereinafter reviewed and which are producer-controlled, with the Director of Marketing as a member ex officio, operate, unless otherwise indicated, under *The Primary Producers' Organisation and Marketing Acts, 1926 to 1941*.

COUNCIL OF AGRICULTURE.

The constitution of the Council of Agriculture comprises the Minister for Agriculture and Stock, the Director of Marketing and representatives elected by the several commodity boards, including the Committee of Direction of Fruit Marketing and the Queensland Cane Growers' Council.

The Council of Agriculture meets annually (except for emergency meetings) and between annual meetings the business of the Council is carried on by an executive committee.

In the course of the year the Council has assisted in the compilation of costs of production in the dairy industry to provide data for the information of the Prices Commissioner to assist him in advising the Commonwealth Government in relation to war-time subsidies in the dairying industry.

The Acting Secretary of the Council also has represented the several commodity boards at hearings of the Commonwealth Arbitration Court in connection with a proposed rural award.

ARROWROOT BOARD.

The Board has an indefinite term and functions in respect of both arrowroot bulbs and arrowroot flour.

1944 Crop.—The quantity of flour received by the Board amounted to 592 tons, which was manufactured from 5,973 tons of bulbs.

In the course of the year, the basis of 10 tons of bulbs to 1 ton of flour was exceeded in several cases, the percentage being as high at times as 11 tons of bulbs to 1 ton of flour.

The arrowroot industry was unable to meet from this crop the war-time demand of 2,000 tons of flour, and half of the 592 tons received was disposed of for industrial purposes associated with the war effort, the remainder being distributed for Army, hospital, Red Cross, canteen and civilian requirements.

The advances paid by the Board to growers on bulbs delivered to the mills totalled £2 10s. 7-125d. per ton, after deducting the Board's administrative levy at the rate of 1s. per ton, compared with £2 7s. 2d. per ton in the 1944 season. Millers have received £13 per ton of flour manufactured, compared with £12 12s. per ton in the previous season.

1945 Crop.—Because of the shortage of manpower and the expansion of other crops giving a higher net return it is thought that the 1945 crop will be well below the 1944 output.

ATHERTON TABLELAND MAIZE BOARD.

The Board is empowered to function to 30th June, 1955.

1943-44 Season.—A sixth advance of 10s. per ton, a seventh advance of 5s. per ton, and a final advance of 2s. 3d. per ton were made to growers, making the total payment to growers £10 17s. 3d. per ton of maize containing 3 per cent. dead grain, with relative premiums and dockages according to quality. Total payments for the previous season amounted to £9 15s. per ton.

1944-45 Season.—

STOCK TRANSACTIONS.

	Tons.	Tons.	Tons
Stock on hand from 1943-44 Pool	..	..	42
Maize received from Growers	..	17,638	..
Less returned to growers	127		
Less moisture deductions to 14 per cent., &c.	588		
		715	
			16,923
			16,965
Sales—			
Maize	..	16,774	
Offal	..	228	
		17,002	
Less weight of bags	..	246	
		16,756	
Stock on hand	..	37	
			16,793
Under run for season	..	..	1 72

Excluding maize resold to growers amounting to £873 6s., the season's sales totalled £222,276 19s. 5d. This total does not include sales of pig and poultry and cattle foods, but includes the value of 1,542 tons maize used in these preparations.

Growers were paid a first advance at the rate of £9 per ton on maize delivered to the Board.

ATHERTON TABLELAND MAIZE GUARANTEE AND SUBSIDY SCHEME.

During the 1944-45 season a price of £12 10s. per ton at silos was guaranteed by the Commonwealth Government for maize delivered to the Board.

Maize sold by the Board to essential feeders of pigs, poultry and dairy cattle was subsidised by the Commonwealth Government at the rate of 2s. per bushel plus freight on trucks of 6 tons and over, and was sold at £8 10s. per ton, buyers' station. The guarantee and subsidy scheme was confined to the area of Queensland north of St. Lawrence.

Merchants in the main North Queensland centres, the Atherton Tableland Maize Board, and the Department co-operated with the Commonwealth Government in implementing the subsidy scheme.

The subsidy scheme made possible a considerable saving in transport as the sale of Atherton Tableland maize was confined to a restricted area from which, during the operation of the scheme, wheat was excluded by means of a transport ban.

A very heavy increase in demand, particularly by dairymen on the Tableland, resulted from the sale of the cheaper grain, and by the end of February the crop of 16,000 tons had been exhausted, except for a reserve kept to maintain mash manufacture by the Board.

Wheat deliveries were then resumed to replace maize until the next harvest.

A total of £37,010 subsidy and £7,207 13s. 1d. freight rebate on 9,253 tons of maize was claimed in respect of the subsidy scheme. Thus, 58 per cent. of the crop was sold at subsidised rates. This would have been even greater, but for the fact that the subsidy scheme was not fully implemented until late in 1944, particularly in the Townsville district.

The Commonwealth authorities propose to continue the guarantee and subsidy scheme during the 1945-46 season, but because of the very light crop of maize on the Tableland the area of the scheme has been restricted to that part of North Queensland north of Tully, and even then it will be necessary to supplement maize with wheat in this area. The guaranteed price has been increased to £15 per ton at silos in order to help compensate for the poor crop.

BARLEY BOARD.

The Board is empowered to function to 23rd April, 1948.

With a limited demand for malting barley because of the continued closure of the Board's malthouse, large quantities of barley had to be sold for stock feeding.

1943-44 Season.—Barley received into the pool totalled 55,807 bushels 46 lb. A market was obtained for 12,952 bushels as malting barley at a price basis of 5s. 9d. per bushel for No. 1 Chevalier. The remainder was sold on the feed market. Total sales of barley from the pool were 54,698 bushels. Weight loss amounted to 1,109 bushels. A summary of the payments to growers follows:—

		First Advance.	Final Advance.	Total Paid.
	Bushels. Lb.	s. d.	s. d.	£ s. d.
Chevalier—				
No. 1	14,619 20	2 6	1 0	2,558 7 10
No. 2	21,243 09	2 3	1 0	3,452 0 1
Feed	10,131 38	1 9	1 0	1,393 2 6
Cape—				
No. 1	880 23	1 9	1 0	121 1 3
No. 2	5,652 40	1 9	1 0	777 5 3
Feed	3,280 16	1 9	1 0	451 1 0
	55,807 46			£8,752 17 11

Working expenses of the pool amounted to £1,806 4s. 7d., and the balance of £74 4s. 8d. was transferred to the hail insurance reserve account. No claim was received for hail insurance, and £435 8s. 4d. balance in the fund was transferred to 1944-45 pool.

1944-45 Season.—Deliveries to date total 56,943 bushels, comprising 50,620 bushels of Chevalier and 6,323 bushels of Cape barley.

Advances to growers totalling £12,624 3s. 8d. have been made at varying rates ranging from 2s. 6d. per bushel to 5s. per bushel, according to quality. An amount of £70 16s. 3d. is held by the Board in respect to a consignment of 87 bushels

of Chevalier and 158 bushels of Cape barley seized by the Board and for which further information concerning the grower or growers is required.

All stock has been sold, including a weight gain of 6 bushels 44 lb. Sales as malting barley totalling 31,151 bushels were made at rates of 6s., 5s. 9d., and 5s. 6d. per bushel.

The policy of having all barley delivered to a centre was departed from in respect to grain sold to the stock feed market. There was heavy demand because of the feeding grain shortage. The prompt clearance of stocks permitted of the first advance to growers being made on the basis of selling price less 1s. per bushel. Total sales realizations were £15,630 1s. 1d.

The Board is negotiating with the State Wheat Board for the transfer to the Barley Board of the Black Gully malthouse which the Wheat Board is utilizing as a store for wheat sacks and feed wheat. Previously in 1940, the two Boards had reached an advanced stage in negotiations for the transfer of this property when the matter had to be temporarily held in abeyance because of the acquisition of barley by the Commonwealth Government under the *National Security Act*.

BROOM MILLET BOARD.

The Board is empowered to function to 31st October, 1949.

1943-44 Season.—During this season which covers the period 1st November, 1943, to 31st October, 1944, 88 tons 10 cwt. 2 qrs. 1 lb. of broom millet was received and sold. This quantity realized £6,672 12s. 1d., or an average of £75 7s. 6d. per ton. The maximum price realized was at the rate of £81 4s. per ton and the minimum price was at the rate of £50 per ton.

1944-45 Season.—From information contained in return forms received from growers, it was realised that the crop would not be a heavy one, consequently it was decided to deal with the crop on similar lines to those adopted for the last few seasons.

From 1st November, 1944, to 30th June, 1945, 72 tons 8 cwt. 1 qr. 2 lb. of broom millet was received and sold, this quantity realising £5,448 8s. 6d., or an average of £75 4s. 10d. per ton. The maximum price realized was at the rate of £84 per ton and the minimum price was at the rate of £50 per ton. As the quantities produced each season were not sufficient for requirements, broom manufacturers were requested by the Department of Supply and Shipping to mix grass-tree and Darwin grass with the millet, in order to try to meet the demand for brooms.

In the course of the last twelve months two more broom manufacturers commenced business, one at Rosedale and the other at Rockhampton, their aim being to capture the North Queensland market for brooms, which was previously supplied from the South.

BUTTER BOARD.

The Board is empowered to function to 31st December, 1947.

Production.—The Queensland production of butter taken into account for equalisation purposes for the year ended 30th June, 1945, was 1,696,637 boxes, compared with a total manufacture of 1,811,016 boxes in 1943-44.

Sales.—Sales of Queensland butter during 1944-45 totalled 1,692,495 boxes. Details are as follows:—

	Boxes.
Queensland sales	797,808
Interstate	103,155
Great Britain	787,862
Ships' stores and countries other than Great Britain	3,670

Consumption.—The quantity of butter consumed in Queensland declined from 912,308 boxes in 1943-44 to 802,808 boxes in 1944-45. The record consumption in 1943-44 can be attributed mainly to heavy demands by Australian and Allied Services, and although consumption in the year under review is less than the record of the previous year, it is considerably higher than the quantity of 537,915 boxes consumed in Queensland in the immediate pre-war year 1938-39.

Values returned to Manufacturers.—The total net value to manufacturers of the 1,692,495 boxes of butter produced in 1944-45 is set down at £6,498,289, which is equivalent to £3-83947322 per box of 56 lb., or 1s. 4-45d. per lb., compared with 1s. 4-41d. per lb. for the previous year. The 1944-45 figures are interim only as values for the period October, 1944, to June, 1945, are subject to adjustment when the Commonwealth Dairy Produce Equalization Committee is completing its figures for the equalization periods involved.

The values given represent net returns at agents' floors, Queensland ports of shipment, or other recognised centres of distribution; only local transport charges require to be deducted to establish net returns to individual factories.

Sales of Surplus Butter to Britain—Long Term Contract.—The following are the main provisions of the long term

contract between the Commonwealth Government and the United Kingdom Government for the sale of Australia's surplus butter:—

- (i.) The contract to be for a 4-year period, commencing 1st July, 1944.
- (ii.) Price of 147s. 9d. per cwt. English currency or 184s. 8½d. Australian currency f.o.b. for choice grade, with reductions for lower grades.
- (iii.) The price for the year commencing 1st July, 1946, to be determined before 1st May, 1946, and the price for the year commencing 1st July, 1947, to be determined before 1st May, 1947.
- (iv.) The United Kingdom to undertake responsibility for storage costs and advances if unable to provide ships to lift butter after a period of 90 days.

Dairy Industry Subsidy.—The rates of subsidy announced in the annual report of the Director of Marketing for the year 1943-44, viz.:—April-November 6½d. per lb. butter-fat, and December-March 4½d. per lb. butter-fat—was calculated to add 4½d. per lb., or 42s. per cwt., commercial butter to the net market or equalization return to the factory, and were designed to bring such return to 196s. 7d. per cwt., the figure named by the dairy industry in its costs submission to the Commonwealth Government of March, 1944, as necessary to permit of a return to the dairy farmer of 1s. 7-3d. per lb. to cover production costs.

It was originally intended that the rates of subsidy set out above should apply for two years from 1st April, 1944. However, the price position was substantially altered by the long term contract with the United Kingdom, which resulted in an increase in the net market or equalization return and permitted of the achievement of the objective figure at a lower subsidy rate.

To meet the altered circumstances, a new scheme of subsidy payment was applied in respect of the subsidy year commencing 1st April, 1945, this providing for the achievement of the factory objective of 196s. 7d. per cwt. by—

- (i.) a general subsidy throughout the year to raise the equalization value to 187s. 3d. per cwt. of commercial butter; and
- (ii.) an additional subsidy of 2-66d. per lb. butter-fat applied to the production of the months March to September (inclusive), calculated to add an average of 9s. 4d. per cwt. or 1d. per lb. commercial butter equivalent to the total production for the year, and thus bring the overall value to the objective figure of 196s. 7d. per cwt.

Pending final consideration of a new costs submission to the Prices Commissioner by the Commonwealth Dairy Production Costs Committee—a body representative of recognised dairy farmers' organisations in the different States, the Dairy Produce Control Committee, and the Commonwealth Dairy Produce Equalization Committee—the Commonwealth Government has applied additional subsidies on butter-fat as follows:—

May to August, 1945—2-4314d. per lb. butter-fat.

September and October, 1945—1-2157d. per lb. butter-fat.

Marketing Control in Brisbane.—The Board has continued to exercise full control of the marketing of butter in the Brisbane area, and its operations in this respect, together with the sale of butter concentrated hardened direct to the Services, resulted in a saving to the dairy farmers of Queensland of £79,261 during the year.

Butter for the Services—Butter Concentrated Hardened.—Throughout the year, the Board continued to pack large quantities of butter for the Forces in Australia, the Philippines, and islands in the South-West Pacific area. A considerably improved dehydrated product produced by the Board during the year has been styled, at the request of the Army authorities, "Butter Concentrated Hardened."

CHEESE BOARD.

The Board is empowered to function until 31st December, 1947.

CHEESE PRODUCTION.

Although the total quantity of cheese produced in Queensland during 1944-45 showed a decrease of a little over 600 tons on the previous year's figure, the objective of 10,000 tons was slightly exceeded, despite unfavourable seasonal conditions in what is usually regarded as the flush period.

The production figures for the last four years are set out hereunder in pounds and tons:—

Year.	Lb.	Tons.
1941-42	16,350,560	7,299
1942-43	28,501,265	12,724
1943-44	24,030,545	10,728
1944-45	22,628,095	10,102

VARIETY OF CHEESE MANUFACTURED.

Almost the whole of the State's output was again of the cheddar variety. The following statement shows the quantities of each variety manufactured during the past four years:—

Variety.	1941-42.	1942-43.	1943-44.	1944-45.
	Lb.	Lb.	Lb.	Lb.
Cheddar	16,029,922	27,966,288	23,443,829	22,243,451
Gruyere	35,413	47,167	52,522	9,019
Other Varieties ..	285,225	487,810	534,194	375,625
	16,350,560	28,501,265	24,030,545	22,628,095

DISPOSALS.

Particulars of the disposals of Queensland cheese during the last four years on the various markets are set out hereunder, the figures being supplied by the Commonwealth Dairy Produce Equalization Committee:—

Year.	Local.	Process.	Overseas.	Total.
	Lb.	Lb.	Lb.	Lb.
1941-42	4,891,061	2,114,875	7,590,116	14,596,052
1942-43	9,700,120	2,586,350	15,786,040	28,072,510
1943-44	10,114,077	3,569,607	9,706,388	23,390,072
1944-45	10,055,833	4,021,228	7,271,449	21,348,510

For the last three years the foregoing figures, because of changes effected by the war, require further dissection in order to give a better indication of the actual destination of the cheese sold during the year, and this dissection is set out hereunder:—

Market.	1942-43.	1943-44.	1944-45.
	Lb.	Lb.	Lb.
Sold locally	6,258,385	5,839,332	5,293,560
Interstate (under Permit) ..	3,441,735	4,274,745	4,762,273
Processed for Australian Market ..	2,586,350	3,569,607	4,021,228
Processed for Forces Overseas ..	12,685,441	7,031,465	6,282,314
Exported to United Kingdom ..	3,065,935	2,642,636	948,233
Exported to other Countries ..	34,664	32,287	40,902
	28,072,510	23,390,072	21,348,510

PRICES.

There were no price alterations on the Australian market during the past year, this being in accordance with the Commonwealth Government's policy of price fixation and subsidies. Local market rates for mild cheese continued at 1s. per lb. for mediums and 1s. 1d. per lb. for loaf, with similar rates interstate (excepting that only $\frac{1}{2}$ d. per lb. premium was obtainable there for loaf). The price to processors for their Australian market was 10 $\frac{1}{2}$ d. per lb., whilst for their overseas contracts the price was based on the Ministry of Food prices, which were 87s. 6d. per cwt. to 31st March, and 107s. 6d. from 1st April, 1945, Australian currency.

The average equalization prices for all cheese sold over the past four years are set out hereunder:—

Year.	Average Equalization Price. Per lb.
1941-42	9-109d.
1942-43	9-906d.
1943-44	10-164d.
1944-45	9-937d.

The above figures are exclusive of Government subsidy.

The figure given for 1944-45 is an interim one only, as final equalizations have been completed only in respect of the first quarter.

SUBSIDY.

The Commonwealth Dairy Produce Equalization Committee continued to distribute Commonwealth Government subsidy throughout the year, the total payments to Queensland cheese manufacturers amounting to £194,190 13s. 7d., an average rate per lb. of cheese produced of approximately 2.06d.

The rates at which subsidy was distributed during the year were as under:—

July to November, 1944, 6.375d. per lb. butterfat.
December, 1944, to March, 1945, 4.25d. per lb. butterfat.
April to June, 1945, seasonal subsidy, 2.66d. per lb. butterfat; general subsidy, 10s. 3 $\frac{1}{2}$ d. per cwt. cheese.

In addition, a special subsidy at the rate of 2.4314d. per lb. butterfat was paid for the months of May and June, 1945. Commonwealth subsidy paid to Queensland cheese manufacturers has now totalled £463,269 5s., made up as under:—

	£	s.	d.
1942-43	83,849	4	9
1943-44	185,229	6	8
1944-45	194,190	13	7

VALUE OF PRODUCTION.

Set out hereunder are figures showing the approximate annual value of all cheese produced in Queensland over the past four years—these being arrived at by applying to the

green weight (less 4 per cent. to cover shrinkage) the net average equalization prices, and in the case of the last three years, adding subsidy payments.

Year.	Approximate Value. £
1941-42	602,539
1942-43	1,213,183
1943-44	1,162,215
1944-45	1,093,612

SUPPLIES TO THE FIGHTING FORCES.

Although reduced quantities of cheese were supplied to Service establishments around Brisbane, the Board's operations in this respect resulted in a net profit of £122 4s. 2d., which has since been distributed amongst all manufacturers pro rata on a production basis, as was done in the two previous years, when the net profits were £305 9s. 2d. and £824 18s. 11d. respectively.

A summary of the transactions in the three periods is set out hereunder:—

Period.	Cheese Sold.	Realisation.
	Lb.	£ s. d.
1 October, 1942 to 30 June, 1943	862,130	43,130 18 1
1 July, 1943 to 30 June, 1944	576,220	29,142 6 2
1 July, 1944 to 30 June, 1945	437,807	22,224 9 4

DAIRY PRODUCTS STABILIZATION BOARD.

The Board is empowered to function to 31st January, 1948.

The principal function of this Board, which operates under the authority of *The Dairy Products Stabilization Acts, 1933 to 1936*, is to determine, for promulgation by the Minister, quotas of butter and cheese which may be sold by manufacturers in the course of their intrastate trade in these commodities.

The Board, which is composed of six members of the Butter Board, three members of the Cheese Board, and the Director of Marketing, is one link in the chain of the Commonwealth-wide (excluding the State of Western Australia) stabilization plan for dairy products. Because of the constitutional inability of the Commonwealth Government to enact complementary legislation, the plan is completed by the operation of *The Commonwealth Dairy Produce Equalization Committee Limited* (with its associated State Equalization Committees), a body representative of the butter and cheese manufacturers in the States adhering to the plan and which is registered as a company under *The Companies Acts* of New South Wales. The monthly quotas as promulgated for the intrastate trade in butter ranged from 33.3 per cent. of the total manufacture in the month of November to 98 per cent. in the month of July, and in respect to cheese, 36 per cent. in the month of November to 98.2 per cent. in June.

COTTON BOARD.

The Board is empowered to function to 31st December, 1946.

1943-44 Season.—Sufficient seed to plant 23,406 acres was distributed to 1,787 growers. The total quantity of seed cotton delivered to the Board was 8,515,581 lb. from which was produced 2,946,478 lb. of lint, equivalent to 6,055 bales. This was a reduction of 759 bales on the 1942-43 season.

Payments to growers covering the 1943-44 crop totalled £190,058. The return to growers per lb. of lint produced averaged 15.48d., compared with 15.53d. per lb. for the previous season.

Commonwealth Guarantee.—The Commonwealth Government guaranteed an overall average price to growers equivalent to 15d. per lb. of high grade raw cotton, but the proceeds from sales (15.48d. per lb.) were sufficient to cover the guarantee and no bounty from the Commonwealth was necessary.

Revolving Fund.—The sum of £3,662 was deducted from growers during the 1943-44 season and placed to their credit in the working account reserve revolving fund. A sum of £3,520 was withdrawn from the fund and returned to growers of the 1934 season.

1944-45 Season.—Sufficient seed to plant 12,178 acres was distributed to 900 growers but because of dry spring conditions the area planted did not exceed 8,000 acres, and only 6,118 acres were harvested by 1st August, 1945. It is estimated that the crop will not exceed 1,500 bales of raw lint.

Because of this low production, the Commonwealth Government will this season be called on to subsidize cotton-growers under the guarantee. It is certain that the fixed overhead of the Board will absorb funds to an extent that will bring the net return to growers below 15d. per lb. of raw cotton.

The rates of bounty under the *Raw Cotton Bounty Act, 1940*, were superseded by the Government guarantee of 15d. per lb. raw cotton. However, the expiry of this Act on 31st December, 1945, resulted in a Tariff Board enquiry early in 1945 to report on questions affecting the cotton industry in Australia.

THE FRUIT INDUSTRY.

(1.) THE COMMITTEE OF DIRECTION OF FRUIT MARKETING.

The Committee of Direction of Fruit Marketing, comprising growers' representatives elected by each of the Sectional Group Committees provided for under the Act for pineapples, bananas, citrus, deciduous and "other fruits," with the Director of Marketing as Government representative, has been established under *The Fruit Marketing Organisation Acts, 1923 to 1941*.

The organisation is empowered to function until 31st December, 1949.

PINEAPPLE SECTION.

The total quantity of fruit marketed, including consignments to the canneries, declined from 1,104,791 cases in 1943-44 to 935,094 cases in 1944-45.

Canneries received 276,768 cases, compared with 480,051 cases during the previous year. Of this quantity, 24 per cent., representing 66,705 cases, were "smalls." From this fruit the canneries recovered—

	Dozen.	Dozen.
	30 oz.	16 oz.
Cored and sliced	129,154	1,705
Choice pieces	86,754	7,070
Crushed	2,320	10,179
Fruit salad	52,978	..
Juice	100,242	9,054

The pack was again reserved for Defence requirements, but the following releases were permitted for civilian consumption:—

	July-Dec., 1944.	Jan.-June, 1945.
	Per cent.	Per cent.
Cored and sliced	20	12½
Choice pieces	20	12½
Crushed	50	12½
Fruit salad	10	12½

The diversion of pineapples under the *National Security (Pineapple Control) Order*, which has been periodically in force since 1942, was lifted in October, 1944, and was not applied during the remainder of the year. However, in February, 1945, the industry adopted a voluntary diversion scheme following representations by the Department of Commerce and Agriculture that the fruit was urgently needed for canning for Defence purposes. The diversion was successful in increasing the cannery intake, and had a steady effect on the markets.

Factory Prices.—The price for factory fruit was fixed in February, 1944, at £12 per ton for large fruit, 4 inches in diameter and 5 inches in length, and £7 10s. per ton f.o.r. grower's siding for "smalls," i.e., fruit less than 4 inches in diameter and 5 inches in length. The price was increased by £3 per ton for both grades in February, 1945.

Cannery Labour.—Canners again had a difficult year in respect to their labour needs, but the smaller crop enabled them to process everything available, without loss.

Fresh Fruit Markets.—In the course of the year, 658,326 cases were marketed as fresh pineapples in Queensland and interstate, compared with 624,747 cases in the previous year. Market values remained firm throughout the whole period, and many sales were made at ceiling prices.

Ceiling prices, which were, wholesale per lb.: Brisbane 4d., Sydney 5d., Melbourne 5½d., and Adelaide 6d., were reduced in February, 1945, to Brisbane 3½d.; Sydney, 4½d., Melbourne 4½d., and Adelaide 5½d. per lb.

Queensland Canneries Pty. Ltd.—Queensland Canneries Pty. Ltd., in which the Committee of Direction of Fruit Marketing has a half share, made a net profit of £10,350 2s. 6d. during the year ended 30th June, 1943. There was an undistributed balance of £772 1s. 2d., which made a total of £11,122 3s. 8d. available for distribution.

A delay in price adjustments in respect of Service orders delivered during 1942-43 was the cause of some receipts being too late for inclusion in the 1942-43 accounts. The regulations governing the distribution of the C.O.D.'s share of cannery profits require that a distribution shall be made to suppliers during the year the profit is made. The directors, therefore, decided to credit £3,269 0s. 5d. to the operations for 1942-43. Added to the undistributed profit of £772 1s. 2d., this made £4,041 1s. 7d. available for distribution between the C.O.D. and the Victoria Cross Manufacturing Co. The profit for 1943-44 was then declared at £7,081 2s. 1d.

For 1942-43 the C.O.D.'s share was £2,020 10s. 9d., which enabled suppliers to receive 3s. per ton on factory fruit delivered during 1942-43.

For 1943-44 the C.O.D. received £3,540 11s., which was distributed among suppliers at the rate of 7s. per ton.

Pineapple Funds.—An amount of £2,859 1s. 7d. was disbursed by way of a rebate to growers of 1½d. per case on interstate consignments handled by the C.O.D.

Production Prospects.—An important development likely to affect production in the near future is the use of bulldozers to clear virgin land for pineapple-growers. These machines were used to a small extent in 1944 in the metropolitan area, but have now been transferred to the near North Coast, where 400 acres are being cleared for the spring planting. This is a considerably larger area than could possibly have been cleared by the usual method, and it is expected to have a big influence on future productions, because of (a) the higher yields secured on virgin land; and (b) weed control being easier than on replant lands.

Cool Storage Experiments.—During the harvesting of the summer crop, at the request of the Pineapple Sectional Group Committee, extensive experiments were carried out by the Department of Agriculture and Stock into the use of cool storage for pineapples. The object was to ascertain whether cool storage could be used to improve the quality of the fruit, with a view to stimulating the public demand for fresh pineapples as production increases. The experiments gave promising but inconclusive results and further research will be necessary.

Plans for Stabilizing Production and Markets.—The pineapple Sectional Group Committee has given considerable attention to proposals for stabilizing the pineapple industry in the post-war period in order to ensure that the expected increase in the Australian demand for fresh and processed pineapple will be fully met at economic prices, as well as to provide a surplus for export in the event of the overseas demand being sufficiently attractive.

With the end of the war in sight, consideration has been given to the possible overseas outlet for production surplus to Australian needs. Before the war, the principal overseas markets for Queensland pineapples were the United Kingdom and Canada. The Malayan low-priced, poor quality product dominated these markets. The market for superior quality canned pineapple was largely met by the Hawaiians, with whose product Queensland canned pineapples came into direct competition. Although the quality compared favourably and the imperial preference operated Queensland canned pineapples proved difficult to sell, except at lower prices which were unremunerative to the growers.

An approach has already been made to the Government to establish a research station with the object of improving the production efficiency of the growers.

BANANA SECTION.

Production.—An estimated total of 326,000 (1½ bushel) cases was produced for the year. Although well below the average of recent years, this represents an increase of 30,000 cases on the 1943-44 figures. Progressive increases in production are anticipated, particularly in North Queensland.

Brisbane Wholesale Floors.—The introduction of ceiling prices, margins, and sales by weight at the latter end of the previous year forced the C.O.D. to change its method of selling from sales by auction to direct buying. In growers' interests, a further change was made by the C.O.D. in January, 1945. Since then, case bananas have been ripened and sold on behalf of the grower, who has received the full ripe price on green weights less the wholesaler's margin, which has absorbed the loss of weight in ripening.

Banana Ripe Department (Case Section).—This section has again shown satisfactory progress. A total of 89,758 cases, valued at £192,078, was handled during the year, as compared with 62,288 cases (£119,645) for the previous year—an increase of 44.1 per cent.

(Bunch Section).—A ripe bunch department, selling to the retail trade, commenced operations in July, 1944, to handle bunches which had previously only been sold by the C.O.D. at auction on a wholesale basis. Auction sales of green bananas were discontinued. The support this entirely new activity has been given by bunch growers can be gauged from the fact that this department is now handling up to 15,000 bunches a month.

	1943-44.	1944-45.
Bunches handled	Nil	139,366
Value	Nil	£70,213

Thus, the C.O.D. is now giving growers a direct retail service both on case and bunch bananas. No longer is the Queensland banana-grower mainly dependent on wholesale ripeners for sales to retailers.

Bonus.—Strong grower support for the C.O.D. auction floors during the year 1943-44 enabled the Banana Sectional Group Committee to again rebate to growers 50 per cent. of the total commission charged on the year's sales. This amounted to £7,155.

Banana Ripening Rooms.—In the course of the year a further six ripening rooms were added to the C.O.D. banana ripening plant, giving an extra capacity of approximately 700 cases weekly, or their bunch equivalent. Despite this addition, quantities being handled by the bunch and case ripe departments have increased to such an extent that it has been

necessary to make further provision to take over that section of the ripening plant now being used for the ripening of tomatoes for the Army. Even this addition of a further seven rooms will not more than meet requirements. Progress is evidenced by the following table of comparative quantities ripened:—

—	1943-44.	1944-45.	Increase.
Cases ripened	102,818	145,510	41-52%

(These figures include bunches calculated in equivalent cases).

Variation of Ceiling Prices.—In the course of the year there was close co-operation with the Banana Growers' Federation of New South Wales in representations to the Prices Branch when a drastic reduction in ceilings was contemplated. As a result of the case presented on behalf of the industry, the reduction was much less than originally proposed, and was applied only during the period of heavy summer supplies.

Northern Development.—Hitherto, the North has been handicapped by a lack of scientific ripening facilities, doubly necessary in a hot climate. Without such facilities nothing could be done to increase consumption in the North, and with difficulties in transport to the South any substantial increase in production was fraught with risk. To overcome this position, the C.O.D. erected a set of modern ripening rooms at its Cairns Branch. These have already demonstrated how greatly consumption can be stimulated in the North. Ripening rooms are also in the course of construction at the new premises of the C.O.D. at Townsville.

Northern growers have agreed to a levy of 3d. per case to advertise in North Queensland bananas grown in the North and ripened in the C.O.D. ripening rooms at Cairns and Townsville, strategically placed in relation to the main centres of production—Cardwell and Murray Upper.

CITRUS SECTION.

Citrus conferences were held in Sydney in April, 1945, at which representatives were present from all the mainland States. Lengthy discussions took place with senior officers of Commonwealth Food Control in respect of the Department's requirements of citrus fruits for processing, and with the Prices Branch in respect to ceilings for both market and factory fruits. All States indicated a much lighter crop than in 1944.

Efforts were made by representatives of the industry to obtain a partial release of grapefruit for the civilian market, but Commonwealth Food Control insisted on a complete diversion in the Southern States to canneries. Strong representations were made for an assurance from Commonwealth Food Control that when grapefruit was no longer urgently required for canning, a final season in which half the crop would be made available to the public and half for processing factories would be arranged. The industry objective was to prevent a market collapse, which would probably be inevitable if the ordinary market were suddenly called on to absorb the whole crop after a period of years without grapefruit.

Commonwealth Food Control again required 25 per cent. of the oranges, 100 per cent. of the Sevilles, but only 25 per cent. of the lemons. Following industry representations for a greater intake of lemons, the percentage was advanced to 33½ per cent.

The Prices Branch agreed to a maintenance of last year's lemon ceiling of 20s. per case for the main season and 25s. in the late summer months, but insisted on a reduction in oranges to 16s. in the main season with an increase of 4s. in the spring. The Prices Branch agreed to a continuance of the 1944 factory prices.

The *Citrus Control Order*, by which certain percentages of the production of each variety other than mandarins is directed to factories, was not applied to Queensland for either the 1944 or 1945 crops. Queensland canners will handle all citrus available on a voluntary basis from the 1945 crop of this State.

Queensland growers of early grapefruit were again able to market their crop as fresh fruit, mainly through the C.O.D., to the Services for shipment to the Pacific Islands. Open market sales were confined to Queensland to avoid the Southern criticism that would have followed the appearance on the Southern markets of Queensland grapefruit when the local crop had been directed to canneries.

In 1944, North Queensland growers had a particularly profitable year, but in 1945 most of the Service demands had ceased, and on a number of occasions both the Cairns and Townsville markets were glutted. Every possible assistance was given the industry by the C.O.D., which made known the position publicly and appealed successfully to private consumers to assist by buying case lots.

Unfortunately, Northern practices in culture, preparation for market and packing leave much to be desired, and until conditions in these respects are improved the North will

continue to be dependent on local outlets and will be subject to periodic gluts. It should be possible for the North to turn out citrus fruit suitable for despatch to the southern markets, when certain parts of the North would be able to take advantage of its natural earliness.

DECIDUOUS SECTION.

After the record 1943-44 season, the 1944-45 season appeared to be a light crop, but the aggregate tonnages proved higher than for any season prior to 1943-44. The following summary shows the tonnages despatched to the three main markets over the past four years:—

—	1941-42.	1942-43.	1943-44.	1944-45.
	Tons.	Tons.	Tons.	Tons.
Brisbane (including factory)	13,178	15,873	25,328	18,688
New South Wales	1,666	1,278	426	1,212
North Queensland	775	1,319	3,009	1,687
	15,619	18,470	28,763	21,587

It is interesting to note that in 1944-45, 1,049,654 packages of fruit were railed to the Brisbane market on the C.O.D. train, as compared with 1,415,681 packages in the record 1943-44 season, and 979,681 packages, which was the highest total recorded prior to the 1943-44 season.

An increased production of vegetables was the main factor in the tonnage being maintained. Because of frost and hail damage much smaller quantities of fruit were marketed. The variety of fruit most affected was apples. Only 104,523 bushel cases were received on the Brisbane market in 1944-45, as compared with 310,866 cases in 1943-44. There also was a marked decrease in the quantities of pears, plums, apricots and peaches marketed, but tomatoes received on the Brisbane market increased from 279,460 cases in 1943-44 to 339,866 cases in 1944-45.

Realizations for all varieties of fruit were excellent throughout the season. Vegetable realizations fluctuated in accordance with the weight of supplies delivered.

Hail damage was on a larger scale than the previous year, but where damage was heavy it was in confined areas.

The unloading of fruit and vegetables from the Stanthorpe district at Roma Street Station was again organised by the C.O.D., with excellent co-operation forthcoming from the Railway Department, Storemen and Packers' Union, the fruit trade and market employees. Fortunately, the district did not have the shortage of cases as was experienced in the previous year, which meant that the crop was marketed without the delay previously occasioned.

The application by the C.O.D. on behalf of the Deciduous Sectional Group Committee to the Department of War Organisation of Industry for a permit to erect a cold store at Applethorpe was not approved. The proposed cold store, amongst other uses, was intended as one of a chain of facilities which would enable a plan to be implemented providing for the pre-cooling of the softer varieties of fruit and vegetables for despatch in refrigerated wagons, when available, to those far Northern and Western centres which have cold storage facilities. Cool storage space is now available in Cairns and Mount Isa, and by next summer will be available at the C.O.D. Branch in Townsville.

Each year South Queensland receives large quantities of fruit transported from the Southern States in iced wagons. It usually arrives in excellent condition. In N.S.W. iced wagons are even used for fruit between Griffith and Newcastle.

Improved distribution of fruit and vegetables to the North and North-west, particularly in the summer, is a matter to which the C.O.D. and the Marketing Branch of the Department had given close attention in the years immediately preceding the war. Summer production of fruit and vegetables is concentrated in a small inland area close to the N.S.W. border—the Granite Belt. This State, with its warmer climate and great mileages, requires the most efficient methods of handling and transporting her primary products. The move by the C.O.D. for the construction of a cold store and pre-cooling plant at Applethorpe was intended to supply the pre-requisite of refrigerated transport—pre-cooling—and would follow the erection of small cool rooms by the C.O.D. at Cairns and Townsville for receiving and holding. An appeal was lodged with the Minister for Post-War Reconstruction, a delegation including a representative of the Council of Agriculture, which lent its support to the appeal, visiting Canberra for this purpose. The Minister's decision is awaited.

OTHER FRUITS SECTION.

Tomatoes.—For some years, the C.O.D. has planned the establishment of tomato ripening rooms in Sydney, where most of the Queensland tomatoes arrive green. They are required by the retailers coloured to ripe. Subject to Treasury approval, an old but very substantially constructed building is being purchased close to the markets where it is hoped to instal a ripening plant.

Interstate loadings showed a substantial recovery. The following table gives comparative loadings for the last six years, and indicates the likelihood of even greater production with favourable seasons and more labour:—

	Cases.
1939-40	606,653
1940-41	695,862
1941-42	513,385
1942-43	496,647
1943-44	435,975
1944-45	717,785

The above figures include Stanthorpe figures which vary with N.S.W. crop conditions.

Stanthorpe interstate loadings ranged from 8,053 cases in 1943-44 to 210,325 cases in 1939-40. For 1944-45 they were 84,280 cases.

Strawberries.—Under war conditions, most of the Melbourne market has been temporarily lost to the Queensland industry. It was previously supplied by the C.O.D. with berries specially packed in ply cartons in sealed tins carried in ship's coolers. This trade will be resumed as soon as shipping space is available. In the meantime small lots have been sent by air to Melbourne and Townsville.

Preliminary discussions have been held with a southern manufacturer who is prepared to enter into long-term agreements with growers for the production of 1,000 annually. If the price appeals to growers a big expansion of the industry should be possible in South Queensland to meet this order in addition to the normal substantial requirements of local canners.

BEAN SECTION.

Two conferences were held of representatives of associations interested in beans.

The 1945 bean canvassing agreement provides for canvassers to be approved by the Southern agents' associations and the C.O.D.

Representations were made to the Vegetable Seeds Committee through and with the co-operation of the Queensland Department of Agriculture and Stock, for the production in Queensland of a maximum of 500 bushels of certified and hand-picked bean seed at a price of 120s. per bushel. Excellent results have been obtained from Queensland certified bean seed, but it was generally found that the green bean market was more attractive than production for seed, except at a much higher price. The representations to the Vegetable Seeds Committee were designed to ensure a supply of locally-grown reliable seed.

GENERAL.

Sydney.—Records were again established both in turnover, and number of packages sold. Consignment sales amounted to £459,638, compared with £323,600 in 1943-44.

Progress can best be gauged by the following table of packages sold:—

1936-37	132,294
1937-38	185,325
1938-39	243,576
1939-40	241,125
1940-41	292,162
1941-42	345,296
1942-43	386,983
1943-44	459,119
1944-45	579,299

The two leading varieties in the year's total were: pineapples, 187,547 cases; tomatoes, 122,716 cases.

Two tropical fruits to which special attention also is given are papaws and custard apples, of which 18,062 cases and 10,916 cases, respectively, were sold. Of Queensland deliveries the Sydney Branch handled: custard apples, 73.24 per cent.; papaws, 67.48 per cent.; pineapples, 58.03 per cent.; bananas, 39.94 per cent.; beans, 28.44 per cent.

Newcastle.—After protracted negotiations, the C.O.D. was successful in purchasing the business of N. & A. Newcastle complete with banana ripening and cool rooms, and opened in this market on 26th February, 1945. Previously, Newcastle had received most of its requirements through the Sydney markets, a method which substantially increased wholesale prices in Newcastle without any corresponding benefit to growers. Considerable success has been achieved by the C.O.D. in arranging direct consignments, a service which is greatly appreciated by the retail trade, and which opens the way for considerable development of further outlets for Queensland fruit and vegetables.

Turnover was approximately £37,000 for the four months' trading.

Brisbane.—Despite the lighter Stanthorpe crop, deliveries were such that the Brisbane floors were frequently taxed for accommodation. A further record was established with a consignment turnover of £523,936, the first occasion that any C.O.D. sales floor had reached the half-million mark. This figure is exclusive of the Brisbane banana branch, with its sales for the year of £262,300.

Combined Brisbane consignment sales of all fruit and vegetables thus exceeded £750,000. Every package was obtained on a voluntary basis, clearly demonstrating the grow-

ing realization by growers of the value of their own sales service. Expansion may be restricted or actually prevented by the inability of the C.O.D. to secure further floor space in the markets.

Rockhampton.—In 1943-44, Rockhampton experienced boom conditions as a result of a big concentration locally of U.S. troops. There was a spectacular demand for fruit and vegetables at high prices. This was reflected in the branch consignment figures for the year of £186,600. With the sudden departure of the troops, the boom collapsed, and serious vegetable gluts were experienced as the market returned to normal.

This branch operates a country order department and two retail shops, in addition to the wholesale floor, the turnover of which was £89,000 for 1944-45. The branch is equipped with ripening rooms, and during the year handled over 90 per cent. of the bananas produced locally.

Bowen.—Despite a dry season and a severe attack by grubs of the tomato crop, the district had a good season.

In the course of the year the local trade unions approached the Bowen Town Council to open a municipal market for fruit and vegetables, and the Council requested the C.O.D. to take action. A retail department was established in the main store of the C.O.D. in Bowen, which is centrally situated. This department has been instrumental in increasing distribution, and should be further strengthened and of great value to the public when intended additions to the building are made, and a cool room constructed.

The branch was successful in placing many thousands of second-hand cases with growers, thus materially assisting the authorities to cope with the case shortage.

Townsville.—For years this branch was seriously handicapped by unsuitable premises, and every effort to improve conditions by the purchase of a building or alterations to the premises leased by the C.O.D. failed. The C.O.D. succeeded eventually in purchasing a property near the Ross River, which has been converted into a wholesale floor and offices. Banana rooms and cool rooms were in the course of construction at the close of the year.

Consignment turnover for the year of £163,384 exceeded the previous record of £143,449 in 1943-44.

Cairns.—In the course of the year the building owned by the C.O.D. was extended to accommodate the banana ripening plant, and the offices were remodelled to afford the staff improved working conditions. Scientifically ripened bananas are now one of the main lines handled.

With reduced Service demands, the branch has faced serious marketing difficulties with oranges, mandarins, cabbage, and lettuce, with every indication of oversupplies of other varieties of vegetables. To consider every practicable means of increasing consumption, the C.O.D. called a conference of producers, distributors, and consumers on 15th June. An advisory committee was appointed. At the end of the year plans were complete for the inauguration of a road delivery service to towns as far south as Tully, and this service commenced in the first week of July. It has great possibilities.

During the year consignment turnover was approximately £142,600, £13,000 higher than the previous year.

Atherton.—This branch operated essentially as a collecting and distributing depot for the Army, particularly of vegetables grown on the Tableland and at Mareeba. With the cessation of most of the Service demands, growers had to be placed on delivery quotas towards the end of the year. Early discussions are contemplated with Commonwealth Food Control on the advisability of closing this branch. It did invaluable work when local troop concentrations were heavy.

Consignment Turnover.—Comparative turnover of all wholesale floors for the years 1943-44 and 1944-45 (estimated) were:—

	1943-44.	1944-45.
	£	£
Sydney	323,600 (a)	459,600
Newcastle	Nil	37,000
Brisbane	445,300 (a)	523,900
Bananas (Brisbane)	230,200	262,300
Rockhampton	186,600	89,000
Townsville	143,400	163,400
Cairns	129,200	142,600
	£1,458,300 (a)	£1,677,800

(a) Corrected.

Bonus Distribution (Sections).—In November and December, 1944, a bonus distribution of 45 per cent. of commissions on consignments to the C.O.D. floors for 1943-44 was made. The amount distributed was £43,890, as compared with £31,124 for the previous year at the rate of 50 per cent.

Merchandise Department.—The turnover again increased for the year 1944-45, and was £151,000 (estimated), as compared with £127,600 for 1943-44 and £88,830 in 1942-43. A bonus at the rate of 4½ per cent. was paid to growers on their previous year's purchases, and absorbed £4,075.

Country Order Department.—Substantial progress was again made by this Department, as evidenced by the following schedule:—

	1942-43.	1943-44.	1944-45.
Packages	57,042	125,876	214,429
F.o.r. value	£50,666	£109,600	£198,296

Of the quantity handled for the year, 37.46 per cent. was procured from the C.O.D. wholesale floors. On such purchases no margin is charged customers, who are thus placed on the same basis as retailers personally buying their own requirements.

Nambour.—Unreasonably high retail prices led the Progress Association, fully backed by local fruitgrower associations, to approach the C.O.D. to open a wholesale-retail branch. The C.O.D. agreed, but found difficulty in obtaining premises. Suitable temporary accommodation, complete with cool room, was eventually leased, and at the close of the year plans were complete for an early opening.

This occurred on 5th July, 1945, with every indication of strong local support of a much-needed distributing centre of quality fruit and vegetables at retail rates in conformity with wholesale prices.

Army and Navy Servicing.—Throughout the year the C.O.D. procured the vegetable and fruit requirements of the Australian and U.S. Armies and the U.S. Navy. Service depots were operated by the C.O.D. in Brisbane, Rockhampton, Townsville, Cairns, and Atherton. Large quantities of vegetables, mainly potatoes, cabbages, and onions, were crated in the Brisbane depot for shipping orders. Some indication of the magnitude of this work is given by the fact that the Brisbane depot used 1,283,000 feet of wire for wiring vegetable crates and fruit cases in a six-month period.

Large quantities of tomatoes were ripened for the Services in the Brisbane banana ripening rooms. Increased deliveries of bananas made it imperative for additional ripening space to be made available, and it was decided to construct for the Army a set of tomato-ripening rooms in the Makerston Street Army Depot. The rooms have been built and are awaiting installation of machinery.

Delays in Transport to the North.—Each year traffic to North Queensland is generally delayed by the flooding of the Burdekin River. It has been the custom for C.O.D. head office to keep in touch with flood conditions through the Railway Department and the C.O.D. loader at Home Hill.

In February, 1945, there were heavy rains, and traffic was blocked for about three days. Early in March, about sixteen spans of the Inkerman Bridge were either destroyed or badly damaged.

In the past it has been customary when the Burdekin has been flooded, and the bridge under water, to divert traffic via Rockhampton and Winton, taking generally 24 to 30 hours longer than the time taken via the coastal route. Accordingly, arrangements were made for the C.O.D. fruit train ex Roma Street on the 9th March to be sent this route. The Winton line, however, was not built for heavy traffic, and congestion was such that about four days extra were required to reach Townsville. To relieve the position, the Railway Department issued instructions not to receive any non-perishables. There was, nevertheless, a big hold-up of non-perishable consignments at Rockhampton—approximately 15,000 tons—with a serious delay in the return of empty wagons from the North, causing an acute shortage of wagon supplies for South Queensland. The Railway Department advised the C.O.D. that restrictions would have to be placed on the quantity of fruit and vegetables for the North. This would have been serious for both consumers and producers. Finally, it was agreed that, subject to a special collection by the Railway Department of a transshipping charge of 10s. per ton with a minimum of 1s., the C.O.D. would tranship all fruit and vegetables across the Burdekin, and, later, eggs, bacon, cheese, and tobacco for civilian use, subject to a daily despatch from Roma Street of special fruit trains not exceeding 150 tons net on any one train. This work was carried out smoothly, and resulted in full supplies of fruit and vegetables getting through to the North with minimum delay. Normal traffic over the bridge recommenced on 24th May. Thanks are due to the General Manager, Queensland Railways, Mr. T. E. Maloney, and his staff for their valued assistance during this period.

FACTORY ACTIVITIES.

The following quantities of the various fruits were handled for factory purposes in the course of the 12-month period:—Stanthorpe fruits, 401 tons; citrus fruits, 1,134 tons; figs, 106 tons; papaws, 403 tons; passion fruit, 6 tons. Metropolitan tomatoes, 84 tons; strawberries, 19 tons; and pineapples—winter crop, 1944, 3,326 tons; summer crop, 1945, 3,616 tons; making a grand total of all factory fruits, 9,095 tons.

INTERSTATE TRANSPORT.

There was a very substantial increase in interstate railings—

	1943-44.	1944-45.
To—	Packages.	Packages.
Victoria	298,659	406,398
New South Wales	972,329	1,369,088
	1,270,988	1,775,486

Increases were most marked in—tomatoes, 281,810 cases; pineapples, 137,289 cases.

Strawberry Consignments.—Interstate, by passenger train, during the last two years were:—

	Equiv. Pint Boxes.
	1943-44. 1944-45.
To—	
New South Wales	143,524 195,520

DIRECTIONS.

The following fruits have been under the control of the Committee of Direction for the year ended 30th June, 1945, by direction:—

For Factory purposes—

Deciduous	extended to 21-1-46
Fig	extended to 9-2-46
Papaw	extended to 24-3-46
Citrus	extended to 12-6-46
Tomatoes	extended to 26-5-46
Pineapples	extended to 12-6-46
Strawberries	extended to 23-7-46
Passion fruit	extended to 30-11-46

LEVIES.

The following levies have been in operation during the year ended 30th June, 1945:—

Banana Levy.—At the rate of 1d. for every £1 or part thereof of the gross proceeds realized from sales in Queensland of bunch bananas and ½d. per 1½ bushel case of bananas. Extended to 31st December, 1945.

NOTE.—In June a new levy on bananas railed from Proserpine and northwards was applied for to provide a fund for advertising in North Queensland, bananas south of Proserpine to continue on the existing levy. This new levy came into operation on 1st July, 1945, and is extended to 31st December, 1945.

Citrus Levy.—At the rate of ½d. per case (irrespective of size) with a minimum of 1d. to be expended in the interests of the citrus section. Increased to 1d. per case on 1st March, 1945. Extended to 31st December, 1945.

Pineapple Levy.—(a) Fresh Fruit. At the rate of 1d. per case or 21 loose on Smooths, and ½d. per case or 42 loose on Rough and Ripley varieties, the moneys collected to be for advertising, administrative and stabilization purposes. Extended to 31st December, 1945.

(b) Cannery Revolving Fund.—Levy 10s. per ton or 3d. per case on factory fruit only, for the purchase of half-interest in Queensland canneries. The purchase has now been completed and this fund will commence to revolve when the amount available is sufficient to refund to all growers the total levies for the first year of contribution.

Stanthorpe Levy.—At the rate of 3s. 4d. per ton on all fruit and vegetables marketed from the Stanthorpe district, the fund so created to be for administrative purposes. Extended to 31st December, 1945.

Hail Insurance Levy.—At the rate of 7s. 6d. per ton in the instance of apples and 6s. 8d. per ton in the instance of fruit, other than apples, grown only in the northern portion of the Granite Belt, being the contributions of the growers concerned to a hail insurance fund. Continuous, subject to demand for a ballot by growers.

Papaw Levy.—At the rate of 1d. for every two cases or part thereof, half the fund so established (with a minimum of £124 and maximum of £175 per annum) to be used to subsidize the appointment by the Department of Agriculture and Stock of a papaw research officer, the balance of the funds to be used for advertising purposes. Extended to 31st December, 1945.

Tomato Levy.—At the rate of ½d. per case, but no levy on consignments of less than four cases, to be used for administrative purposes. Extended to 31st December, 1945.

Fig Levy.—At the rate of 5s. per ton on factory figs, the fund created to be used for advertising purposes. Extended to 31st December, 1945.

Avocado Levy.—At the rate of 1d. per case, gazetted 15th July, 1941, the funds to be expended in advertising. No specified time for termination.

REFUNDS TO GROWERS.

Refunds to growers under various system of finance during the period of twelve months ended 30th June, 1945, were:—

Freight Rebates.—Pineapple.—A rebate of 1½d. per case made on all interstate consignments during 1943-44 amounted to £2,859 1s. 7d. and was paid in January, 1945.

Citrus.—A rebate at the rate of 1d. per case on interstate consignments during 1943-44 absorbed £124 14s. 2d.

Deciduous—Northern and Interstate.—A rebate at the rate of £1 per ton was distributed to growers consigning interstate and to the C.O.D. branches in Rockhampton, Townsville, and Cairns. This rebate was paid in October, 1944, and totalled £3,270 16s.

Deciduous—Brisbane Train.—A rebate at the rate of 2s. 6d. per ton was paid in August, 1944, on consignments to Brisbane during the year 1942-43. This amounted to £1,867 19s. 6d.

Banana.—A rebate at the rate of 1d. per case on interstate consignments during the year 1932 was paid in October, 1944, and totalled £1,497 4s.

Bowen.—A rebate on consignments forwarded during the season 1943-44 was paid at the following rates:—Half bushel, 3d. per case; bushel, 6d. per case; 1½ bushel, 8d. per case; pumpkins, 8d. per bag. The total so rebated was £1,676 1s. 6d.

STANTHORPE CO-OPERATIVE HAIL INSURANCE FUND.

Claims have been paid on 36,293 bushels damaged by hail in the season 1944-45. Payments amounted to £4,194 16s. 10d. SUMMARY OF MONEYS RETURNED TO GROWERS DURING 1944-45.

Freights—	£	£
Pineapple	2,859	
Citrus	125	
Deciduous	5,139	
Banana	1,497	
Bowen	1,676	
		11,296
Fruit sections		43,890
Banana Branch (Green Floor) ..		7,155
Merchandise		4,075
Hail claims		4,195
		£70,611

(2) APPLE AND PEAR MARKETING BOARD.

As in 1943-44, the acquisition of apples and pears applied during the year to crops produced in Western Australia and Tasmania only, Queensland growers being free to dispose of their fruit on the open market.

Sales in Queensland by the Apple and Pear Marketing Board for the 12 months ended 30th June, 1945, were as follows:—

	Apples.	Cases.
From Western Australia		21,240
From Tasmania		489,388
		510,628
Pears—From Tasmania		560

(3) SECOND-HAND FRUIT CASES.

The Second-hand Fruit Cases Committee, which is constituted under "The Second-hand Fruit Cases Act of 1940," has continued to serve the growers of fruit and vegetables by organizing, through its licensed dealers, the recovery of cases used in the marketing of these products and their resale to growers at reasonable prices for further use.

The value of this service to the fruit and vegetable industries, at a time when war-time demands for timber and shortage of manpower have rendered extremely difficult the provision of new cases in sufficient numbers, may be gauged from the following table showing sales of second-hand fruit cases from the commencement of the Committee's operations on 31st March, 1941, to 30th June, 1945.

Sales of Second-hand Fruit Cases.

Year ending 30th June.	Cases Sold.
*1941	172,863
1942	679,832
1943	1,007,803
1944	1,448,545
1945	1,274,953
Total	4,583,496

* From 31st March only.

The drop in sales during 1944-45, as compared with those of the previous year, is accounted for by a reduction in pro-

duction in the Stanthorpe area from the record crop of 1943-44, when an intensive drive for the recovery of second-hand cases was necessary to supply Stanthorpe's requirements.

For a brief period during the year, the supply of second-hand cases was in excess of the immediate demand, and to assist in clearing accumulations of stocks in dealers' stores and thereby enable fruit retailers' premises to be cleared, a total of 68,888 cases, mostly of types unpopular with Queensland growers, were released by the Committee for use in other industries. This over-supply of cases proved to be only a passing phase, and towards the end of the year the demand from growers became more brisk and the Committee found it necessary to close down on releases to other industries, except for unwanted types such as pear flats.

GINGER BOARD.

The Board is empowered to function until 15th July, 1951.

In the 1944-45 season ninety-four growers supplied 297 tons of green ginger to the Board. A total sum of £13,881 was distributed to growers, which is equivalent to 5d. per lb. on green ginger weights.

The arrangement was continued whereby the product is received and handled at Buderim on behalf of the Board by the Buderim Ginger Growers' Co-operative Association, Limited. The association's new factory at Buderim was completed in the course of the year, and a mechanical dicing machine installed.

Plantings in the spring of 1944 for the 1945-46 crop showed an increase on the previous year's plantings, and despite abnormally hot weather in November, which adversely affected the growing crops, it is estimated that deliveries to the Board will approximate 450 tons.

Following are particulars of deliveries to the Buderim factory over the last five seasons:—1941-42, 14 tons; 1942-43, 77 tons; 1943-44, 180 tons; 1944-45, 297 tons; 1945-46, 450 tons (estimated).

HONEY BOARD.

The Board is empowered to function until 8th March, 1947.

Sales by the Board's three agents—two in Brisbane and one in Maryborough—totalled 18,023 (60 lb.) tins of honey and 13,092 lb. of beeswax, compared with 25,613 tins of honey and 9,925 lb. of beeswax in 1943-44.

All the beeswax handled by the Board's agents was sold at 2s. 6d. per lb., while selling prices for honey ranged from 7½d. to 3d. per lb., according to quality.

New regulations promulgated in March, 1945, empowered the Board to issue permits to producers to make direct local sales of limited quantities of honey. Although the regulations also empowered the Board to make a levy for administrative purposes of a rate not exceeding 3 per cent. of the proceeds of sales, the Board decided to limit the rate of the levy to 1 per cent.

PEANUT BOARD.

The Board is empowered to function until 27th August, 1945.

1943 Season.—Transactions in respect of the 1943 season pool were completed on 31st October, 1944, by a final payment to growers of 1.86d. per lb. on all grades and varieties of peanuts received into the pool. Receipts were: Virginia, 12,453,320 lb.; Spanish, 5,035,457 lb.; total, 17,488,777 lb., equivalent to 7,807.49 tons.

The crop was disposed of as follows:—

	Virginia.	Spanish.	Total.
	Lb.	Lb.	Lb.
Sales in Shell	14,023	4,650	18,673
Sales in Kernels	8,229,775½	3,911,405½	12,141,181
Loss in De-shelling	4,209,521½	1,119,401½	5,328,923
Total	12,453,320	5,035,457	17,488,777

Sales.—The 1943 season crop realised a total of £347,235 3s. 2d., an average of 4.765d. per lb. on receipts. Proceeds of sales were distributed as shown hereunder:—

	£	s. d.	Per Lb. on Receipts.
Payments to Growers—			
First Advance	146,981	14 4	2.017d.
Final Advance	135,537	19 0	1.86 d.
Levy collected	18,215	15 8	.25 d.
Expenses	44,625	4 11	.612d.
Transferred to Reserve Account ..	1,874	9 3	.026d.
Total	347,235	3 2	4.765d.

Loss in De-shelling.—The following table contains particulars of de-shelling losses:—

	Virginian Bunch.	Spanish.	Total.
	Lb.	Lb.	Lb.
Receivals—Weight in shell	12,453,320	5,035,457	17,488,777
Less—Sales in shell ..	14,023	4,650	18,673
	12,439,297	5,030,807	17,470,104
Less—Sales in kernels	8,229,775½	3,911,405½	12,141,181
Loss in de-shelling ..	4,209,521½	1,119,401½	5,328,923

The figures above disclose that the loss in the de-shelling of the 1943 crop was 33.8 per cent. of the weight of nuts de-shelled in the case of Virginian Bunch, and 22.2 per cent. in the case of Spanish. In the previous season the figures for No. 1 pool were 35 per cent. and 23.5 per cent. respectively.

1944 Season.—Receivals into the 1944 pool were 21,100,024 lb. or 9,419.65 tons. Particulars of receivals of each variety are set out below:—

	Lb.
Virginia	17,194,412
Spanish	3,893,012
San Jose	11,554
Valencia	1,046
	21,100,024

First advances have been made to growers at a flat rate of 2.375d. per lb. for Virginian, and at 2.25d. per lb. for Spanish and other varieties, from which has been deducted levy at the rate of .25d. per lb. The final payment has not yet been determined.

1945 Season.—Up to 30th June, 1945, a total of 4,405,779 lb. or 1,966.866 tons had been received by the Board, consisting of 3,174,277 lb. Virginia and 1,231,502 lb. Spanish.

Commonwealth Control.—As the Commonwealth Government, under *National Security Regulations*, assumed control over the disposal of the 1943 and 1944 seasons' peanut crops, only one pool operated in each of those seasons. Commonwealth control has been partially lifted for the 1945 crop, but there is still only one pool operating for the 1945 season. The 1945 production goal was fixed at the same figure as that for 1944—namely, 13,000 tons. Because of weather conditions during the latter half of 1944 planting was very late with a consequent late harvest, and only a small quantity of peanuts were received by the Board at 30th June, 1945, whereas in normal seasons the bulk of the crop would have been received at the silos by that time.

It is estimated that when the whole of the 1945 crop is delivered to the Board total receivals will approximate 10,000 tons which, if realized, will be a record crop for Queensland.

Revolving Levy Fund.—Early in 1943 the Board was empowered by Order in Council to increase its levy from ½d. per lb. to ¾d. per lb. on all peanuts received. The object of increasing the levy was to create a revolving fund for the purpose of enabling the Board to repay to growers the moneys contributed by them by way of levy, and used by the Board for the payment of interest and redemption on capital sums raised by the Board to provide silos, treatment plant and other assets.

The levy of ¾d. per lb. has been collected from the proceeds of the 1942, 1943, 1944, and 1945 seasons' crops. Early in 1945 the sum of £15,199 9s. 2d. was transferred from the levy fund to the revolving levy fund account. This amount represented half of the levy funds collected for the 1942 and 1943 seasons' crops, £6,091 11s. 4d. for the 1942 season, and £9,107 17s. 10d. from the 1943 season.

Growers of the 1927 and 1928 seasons were the first to participate in the repayments under the revolving levy fund scheme. Up to 30th June, 1945, £10,316 8s. 9d. was refunded to growers of the 1927 and 1928 seasons.

PIG INDUSTRY.

(1) ACQUISITION OF PIG MEATS.

The marketing of pigs and pig meats continued under the control of the Australian Meat Industry Commission in terms of the *National Security (Meat Industry Control) Regulations* issued in March, 1943, and administered by the Controller of Meat Supplies appointed under the *Regulations* with the assistance of Deputy Controllers in the several States.

The Department was again represented on the Pig Meats Advisory Committee by the Director of Marketing.

Because of the shortage of feed early in 1945, an amendment of the pig meats plan was adopted by which the minimum dressed weight of carcasses was reduced from 100 lb. to 60 lb. This enabled lighter pigs to be marketed at the same scale of prices as for heavier weights. The ban on the sale of fresh pork to the public was continued throughout the year.

The prices under the plan are as follows:—First grade, 9d.; second grade, 8½d.; third grade, 7d.; extra fat, 6½d.; choppers, 5d.; stags and milky sows, 3d.

(2) NORTHERN PIG BOARD.

The Board is empowered to function until 31st December, 1946.

Pigs purchased by the Board for the year are as under:—

	No.	Lb.	Value.
			£
Sold to—			
North Queensland Bacon Association	12,953	1,985,839	66,141
Other sales	170	4,150	272
Insurance fund	48	9,252	291
	13,171	1,999,241	£66,704

The average weight of all baconers was 145 lb., as compared with 139 lb. for the previous year. The average price paid for all baconers of all grades was 8.4d. per lb., the same as in the previous year.

Although the number of pigs handled slightly decreased, the total weight of pigs paid for was a record, this being accounted for by the heavier average weight.

PLYWOOD AND VENEER BOARDS (NORTHERN AND SOUTHERN).

Both Boards are empowered to function until 2nd May, 1947.

On the basis of 3/16 inches equivalent deliveries during the year to the Southern Board were 50,773,381 sq. ft., valued at £412,533, and to the Northern Board 17,495,866 sq. ft., valued at £142,154, a total of 68,269,247 sq. ft., valued at £554,687.

The deliveries to the Southern Board increased by 3,877,044 sq. ft. over those of the previous year, while those to the Northern Board decreased to the extent of 1,008,451 sq. ft., the net result from both Boards being an increase of 2,868,593 sq. ft.

Distribution of sales was as follows:—

	Southern Board.	Northern Board.
	Sq. ft.	Sq. ft.
Queensland	21,096,622	6,219,667
Interstate	29,676,759	11,276,199
	50,773,381	17,495,866

The administrative levy was reduced to ¾d. per 100 sq. ft. as from 1st July, 1944, the cost of administration for the year being .9d. and for quantity discount to Queensland distributors .109d. per 100 sq. ft. All figures are based on the equivalent of 3/16 inches thickness.

THE WHEAT INDUSTRY.

The marketing of the Australian wheat crop has again been the responsibility of the Australian Wheat Board, wheat being subject to acquisition by the Commonwealth Government in terms of the *Wheat Acquisition Regulations* under *The National Security Act*. The State Wheat Board, established under "*The Wheat Pool Acts, 1920 to 1930*," has continued to act as the sole licensed receiver and agent in Queensland for the Australian Wheat Board.

Queensland-grown wheat was again marketed in accordance with the Queensland system of wheat classification, and the usual premiums of 3d. a bushel for Q1 and 1½d. a bushel for Q2 over the basic price were retained by the Queensland Board from the proceeds of sales due to the Australian Wheat Board for distribution to growers of these higher grades.

The price to flour millers for both Queensland-grown wheat and wheat imported from other States was an overall price of 4s. 5d. per bushel at Brisbane for all grades of Queensland wheat and for f.a.q. wheat from other States.

The miller therefore pays no more for the higher grade wheat than he does for the lower. Millers approached the State Wheat Board and claimed that the percentage of high gluten wheat produced had declined. Some millers indicated their willingness to pay special premiums for supplies of specified varieties of wheat. A proposal of this kind was submitted for the consideration of the associated millers, but their decision in the matter has not yet been given.

The co-operative hail insurance scheme was maintained in operation, as in other seasons of Commonwealth acquisition, by deducting growers' contributions from amounts payable to growers by the State Board.

1941-42 Season (No. 5 Pool).—On the 5th June, 1945, the Australian Wheat Board made a fifth advance of 2½d. per bushel, thus bringing the total to date to 4s. 0½d. per bushel, less rail freight, or 3s. 7½d. net at growers' siding. To this, there is added payment from the State Wheat Board at the rate of 3½d. per bushel representing distribution of quality

premium and of profits. The total payment to date for first-quality milling wheat (Q1) is therefore 3s. 11½d. net per bushel at growers' siding, from which ½d. per bushel hail insurance levy has been deducted.

1942-43 Season (No. 6 Pool).—This was the first of the war-time pools to which the bushelage quota scheme applied, i.e., a guaranteed first advance of 4s. per bushel at growers' siding for the first 3,000 bushels of a growers' crop, and a first advance for deliveries in excess of that quantity at such rate as the condition of the wheat market warranted. In the case of No. 6 Pool, the first advance on non-quota wheat paid by the Australian Wheat Board was 2s. per bushel, which was followed by a second advance of 1s. in April, 1944. On the 7th December, 1944, a third advance of 6d. per bushel was paid, and on 22nd June, 1945, a fourth advance of 5d. per bushel, or a total to date of 3s. 11d. per bushel at growers' siding for non-quota wheat. To these payments there is to be added distribution made by the Queensland Wheat Board of quality premiums and profits at the rates of 4½d. a bushel for Q1, 2½d. for Q2, and 1½d. for Q2A and feed wheat. Thus, to date, payments made for the 1942-43 season at growers' siding for Q1 wheat are 4s. 4½d. per bushel for quota wheat, and 4s. 3½d. per bushel for non-quota wheat.

1943-44 Season (No. 7 Pool).—Total receipts by the Australian Wheat Board amounted to 94,928,241 bushels, of which Queensland deliveries comprised 4,599,178 bushels. Payments under the quota plan were increased by 1½d. per bushel for both quota wheat and excess, or non-quota wheat, following on an investigation by a Commonwealth board of enquiry which had been set up to determine the added costs of harvesting arising out of the application of the harvest workers' award made in October, 1943. Payments were made, therefore, on the 10th January, 1945, as follows—viz., quota wheat 4s. 1½d. per bushel at sidings, and non-quota wheat 2s. 1½d. per bushel at sidings.

Further advances on non-quota wheat have since been made as follows:—1s. per bushel on 7th December, 1944, and 7d. per bushel due on 10th July, 1945.

Payment was made also by the Queensland Wheat Board of quality premiums and distribution of profits totalling £65,806 7s. 8d. This payment was made on the basis of 4½d. per bushel for Q1; 2½d. per bushel for Q2; and ½d. per bushel for Q2A and feed classifications.

Classification of Queensland deliveries and payments, inclusive of the hail insurance levy, are tabulated below:—

1943-44 Season.				
Classification.	Deliveries.	Percentage.	Payments.	
			Quota Wheat.	Non-quota Wheat.
	Bushels.		s. d.	s. d.
Milling—				
Q1	2,818,025	61·27	4 5·58	4 0·58
Q2	1,297,148	28·20	4 4·08	3 11·08
Q2A	395,040	8·59	4 1·83	3 8·83
Feed	88,965	1·94	4 1·83	3 8·83
	4,599,178	100·00		

The levy for hail insurance was at the rate of ½d. per bushel on all deliveries, and on wheat retained on farms by growers in excess of 20 per cent. of their crops. Hail insurance compensation to growers amounted to £13,426 4s. Hail assessors' fees and expenses totalled £214 19s. 11d., leaving a balance in the fund of £28,599 4s. 11d. to be carried forward to the 1944-45 season.

Of the total deliveries, 4,122,904 bushels were absorbed in sales to flour mills; 399,394 bushels to the produce trade (including 126,278 bushels of seed wheat); and the remainder was accounted for by weight loss, 76,854 bushels, and fire loss, 26 bushels. Elsewhere herein reference is made to the heavy produce trade demands which were met by importations. For the twelve months of the wheat year ended October, 1944, sales in Queensland of wheat from other States for both milling and feed purposes totalled 5,498,041 bushels. The total usage of wheat in the State was 6,493,601 bushels in flour mills and breakfast food factories, and 3,400,460 bushels for live stock feeding, and 126,278 bushels for seed sold through the produce trade. A grand total of 10,020,339 bushels (exclusive of seed sold to growers by the Board, or of wheat retained on farms).

1944-45 Season (No. 8 Pool).—The Commonwealth Government in recognition of the need for an increase in the production of wheat in Australia had announced in January, 1944, that the first advance for non-quota wheat to be delivered from the 1944-45 crop, would be increased to 3s. per bushel at sidings, as compared with 2s. 1½d. per bushel for the previous season. Unfortunately, disastrous seasonal conditions of unprecedented duration were experienced throughout the wheat belt of the three eastern wheat exporting States. Consequently, deliveries to the Australian Wheat Board from all States amounted to only 38,727,547 bushels.

In striking contrast with the wheat crop conditions in the winter rainfall regions of Australia, the season was good in Queensland with unusually favourable weather at harvesting time. A crop of more than 6,000,000 bushels was grown, and receipts by the Board to date total 5,994,323 bushels, almost all of which has been classified as of milling quality, with a high percentage classified Q1.

Seed Wheat.—The Board has made the usual selections of wheat for planting purposes, and the Queensland Government has undertaken to guarantee up to £5,000 covering seed wheat supplied by the Board on credit to growers in necessitous circumstances.

Wheat Sacks.—Provision for the requirements of wheat and barley growers has been made through the Australian Wheat Board, with the Queensland Wheat Board acting as agent.

Flour and Mill Offals.—The flour tax has continued at the rate of £2 8s. 10d. per ton; and the f.o.r. price of flour at Brisbane at £13 1s. 6d. per ton. Prices for mill offals at mills have ruled as follows:—Bran, £6 5s. per short ton and pollard £7 5s. per short ton.

Usage and Importation of Wheat.—The usage of wheat has shown a remarkable increase since the commencement of the war with Japan. Demand for flour has necessitated operations of the flour mills at full three-shift capacity, and the Commonwealth Government policy of subsidizing the feeding of wheat to stimulate the production of dairy products, pig meats and eggs, has resulted in a wide-spread feeding of wheat to farm stock. The wheat subsidy included the payment of freight where purchase was made in truck load lots, the price being 3s. 6½d. per bushel at buyer's siding.

An illustration of the progressive increase in the use of wheat since the year 1941-42 is provided in the following table, viz.:—

Wheat Usage during Cereal Years—1941-42 to 1943-44.				
—	Cereal Year ending October.			
	1941-42.	1942-43.	1943-44.	
	Bushels.	Bushels.	Bushels.	
Queensland Wheat—				
Sales	2,661,184	4,371,179	4,522,298	
Weight loss, &c. ..	18,714	31,666	76,880	
Delivered to Pool ..	2,679,898	4,402,845	4,599,178	
Wheat from Other States—				
Sales in Queensland ..	2,967,660	4,037,701	5,498,041	
Total Sales in Queensland	5,628,844	8,408,880	10,020,339	

Calculations showed that for the months of November and December, 1944, wheat consumption had increased to a rate of over 13,000,000 bushels per year. Even with the imposition of a feed wheat rationing scheme it was estimated that by November, 1945, consumption will have reached a figure of approximately 11,500,000 bushels for the cereal year, and an import programme was arranged accordingly for the shipment of approximately 5,500,000 bushels of wheat to supplement the Queensland crop of approximately 6,000,000 bushels.

Since these estimates were made the demand for flour from the Services has been reduced to an extent which warrants an easing in the demand for wheat by the flour mills. Poultry flocks also have been reduced in numbers to some extent. It is possible that, as a result of these adjustments, total consumption of wheat to the end of October may be approximately 10,000,000 bushels.

The importation of wheat from New South Wales by rail via Wallangarra ceased on 20th August, 1944, since when all importations of wheat have been shipped to Queensland by boat from South Australia or Western Australia. These importations totalled as at 30th June, 1945, 2,666,835 bushels. For the first three months of the season, 602,786 bushels of Queensland-grown wheat, mostly all of good milling quality, had to be utilized to meet the demand for stock feeding, because the wheat ships chartered by the Australian Wheat Board had to be diverted to carry wheat from Western Australia to India at the urgent request of the British Ministry of Food.

Feed Wheat Rationing.—Early in February, 1945, the Commonwealth Government announced its intention to institute a system of rationing of feed wheat in Australia. This was found necessary because of prevailing dry seasonal conditions which had reduced the Australian wheat crop to a third of its normal size and also to increased consumption by stock feeders under the stimulus of the feed wheat subsidy. By the end of 1944 sales in the Commonwealth had reached a rate equal to 65,000,000 bushels per year. Wheat stocks in Australia permitted the release of no more than 38,000,000 bushels for feed for the eleven months' period 1st January to 30th November, 1945, from which quantity Queensland was allocated 4·1 million bushels.

This allocation was made on the basis of sales of feed wheat in the State during the nine months' period January to September, 1944. It was later increased by 125,000 bushels in order to make provision for the needs of North Queensland, consequent on the termination of supplies of subsidized northern maize.

A committee was set up in Queensland, as in other States, for the purpose of controlling distribution and to ensure the priority of dairy cattle, pigs, and poultry.

In Queensland the committee included representatives of the State Department of Agriculture, the Commonwealth Directorate of Agriculture, the Wheat Board, and Food Control. The Director of Marketing was Chairman of the Committee.

At the time rationing was commenced, it was estimated that Queensland was utilizing wheat for feeding to live stock at the rate of between 6,000,000 and 7,000,000 bushels per annum, compared with approximately 1,000,000 to 1,500,000 bushels per annum before the war and this rate of consumption was increasing. The wheat rationing plan by which Queensland was allotted 4.225 million bushels therefore imposed a tremendous burden on the pig, poultry, and dairy industries, a burden intensified by the partial failure of Queensland's summer grain crops of maize and grain sorghum.

The committee was embarrassed by reason of the high rate of consumption for the first six weeks of the year prior to the announcement of the institution of rationing. This was approximately equivalent to 125,000 bushels per week and had to be reduced to 80,000 bushels per week in order to bring the demand within the limit of the quota. In order to cushion the effect of rationing the rate of delivery was diminished as gradually as possible and machinery was set up to enable cases of hardship to be investigated by departmental officers and the staff appointed by the committee for this purpose.

The administration of the rationing plan was handicapped because of the difficulty of securing staff, and officers of the Marketing Division were closely associated with the various duties involved.

Up to 30th June, 1945, 2,535,885 bushels of feed wheat had been distributed as quotas. Of this quantity 602,786 bushels had been drawn ex Queensland stocks and 1,933,099 bushels had been drawn ex shipments from South Australia and Western Australia.

The rationing scheme was applied also to other subsidized feeding grains, *i.e.*, grain sorghum (see Grain Sorghum Guarantee and Subsidy Scheme) and, in North Queensland, maize (see Atherton Tableland Maize Board). In each instance the grain was used in supplying quotas as an alternative to wheat.

Imported Grain Sorghum.—Arrangements were made by the Commonwealth Government for the importation from the United States under lend-lease of grain sorghum and barley. It is proposed that half of a cargo of 8,050 tons will be unloaded in Brisbane. The grain is being shipped in bulk and will be gristed within the metropolitan area in order to eliminate any danger of the introduction of noxious weeds. It is proposed to distribute the meal sorghum as far as practicable within a radius of 50 miles from Brisbane. The Commonwealth Department of Commerce and Agriculture has advised that this sorghum will replace wheat which it has been found impossible to ship from Western Australia. Its distribution will be supervised by the Feed Wheat Rationing Committee. Receipt from ship and delivery will be the responsibility of the Australian Wheat Board, which authority has erected a bulkhead at Hamilton in which to store the grain.

Wheat Industry Stabilization.—The operation of the Wheat Industry Stabilization Scheme was reviewed at a conference of the Chairmen of State Committees and the administrative officers of the Wheat Industry Stabilization Board, held in Melbourne in September, 1944. The serious effect of the great drought in the southern wheat areas was then apparent. Queensland pressed for a drastic liberalising of the scheme to meet the circumstances which had arisen and this was recommended by the conference.

The Commonwealth Government, in February, 1945, announced its decision that all applications for licenses for wheat planting, irrespective of area, would be granted for the season 1945-46, including new growers and others not provided for in the *National Security (Wheat Industry Stabilization) Regulations*. It was also announced that for the time being the quota plan had been suspended and a first advance of 4s. 3d. per bushel country sidings had been guaranteed for all wheat delivered to the Australian Wheat Board. The Government subsequently announced that this guarantee and the concession in regard to licenses would apply also to the 1946-47 season. The State Wheat Board has made its staff and facilities available to carry out this

scheme which is administered under the supervision of the State Wheat Committee, consisting of Mr. H. S. Hunter (chairman), representing the Commonwealth Government, Mr. A. N. Allen, Campbells Plains, Warwick, and Mr. Andrew Gordon, Oakey.

The following table sets out particulars of licenses and wheat acreages for the seasons 1943-44 and 1944-45, together with progress figures for 1945-46:—

WHEAT INDUSTRY STABILIZATION, QUEENSLAND.

Particulars of Licenses and Acreages.

	Season 1943-44.	Season 1944-45.	Season 1945-46.
1. Licenses issued—			
(a) Original	3,221	3,141	2,784
(b) Sharefarming	361	395	392
(c) Temporary	158	372	620
2. Number of registered farms on which Licenses issued—			
(a) Wheat farms	Not avail- able	Not avail- able	2,786
(b) Temporary wheat farms ..			631
3. Area licensed for grain (acres)—			
(a) Wheat farms	474,277	435,739	424,701
(b) Temporary wheat farms ..	12,343		61,196
(c) Temporarily licensed on wheat farms	16,143	54,704	52,382
4. Total area sown for grain (acres) ..	296,770	320,507	Not avail- able

NOTE.—The particulars for 1945-46 are progress figures only.

GRAIN SORGHUM GUARANTEE AND SUBSIDY SCHEME.

The Commonwealth Government's policy of granting subsidies on feed grains was extended during the 1944-45 season to grain sorghum, and arrangements were made to subsidise grain sorghum purchased by the Commonwealth under a contract between the grower and the Controller-General of Food. The guaranteed price of grain sorghum under contract in Queensland was 3s. 7d. per bushel of 60 lb. as at grower's sending station, plus transport cost, if any, from sending station to receiving depot, for grain sorghum that conformed to prescribed standards of fair average quality grain.

The sorghum delivered under contract was to be sold for essential feeding to pigs, poultry and dairy cattle, at a subsidised price of 3s. 3d. per bushel of 60 lb. delivered at buyer's railway siding, this price for sorghum being the equivalent of the subsidised price for wheat at 3s. 6½d. per bushel.

A committee was set up to administer the scheme comprising representatives of the Department of Agriculture and Stock, the Department of Commerce and Agriculture, the Prices Branch, and the Queensland State Wheat Board. The Director of Marketing was the chairman of this committee.

Unfortunately, seasonal conditions proved unfavourable for planting, and owing to the general uncertainty prevailing growers were reluctant to make contracts. Later in the season this tendency was also influenced by the fact that the increasing shortage of feed grains resulted in growers anticipating prices higher than the contract price of 3s. 7d. per bushel.

Arrangements were made between the committee and the Queensland State Wheat Board for the latter to carry out the functions of receiving and forwarding agent for the committee, and to account for sales to the Australian Barley Board, which organisation attended to the financial side of the scheme for the Commonwealth both in Queensland and in New South Wales. Fifty-eight growers contracted with the Controller-General of Food to grow 4,094 acres of sorghum. A total of 6,777 bushels were delivered by nine growers.

The sorghum delivered under the scheme was distributed to Poultry Farmers Co-operative Society Ltd., Dairy Associations and other merchants, and set off against wheat quotas.

It is proposed by the Commonwealth Government to continue this scheme for the 1945-46 season.

REPORT OF THE STANDARDS BRANCH.

The Standards Branch, which was known prior to the re-organisation of the Department as the Seeds, Fertilizers, Veterinary Medicines, Pest Destroyers and Stock Foods Investigation Branch, first came into being as a seed-testing station in 1914. Since that time, it has gradually expanded the scope of its activity as additional legislative measures have been passed by Parliament, setting minimum standards of quality for goods required by the primary producer in the conduct of his business.

During the year the branch has been engaged mainly in administering rationing schemes for stock foods and fertilizers, rendered necessary by shortage of these commodities because

of seasonal and war-time conditions, respectively. Although the staff has been increased to 37 by the addition of a number of temporary officers, difficulty has been experienced in keeping abreast of the large volume of work which rationing has entailed.

Plans have been made for the branch to concentrate on its normal function when the need for rationing has passed, and in the post-war period to effect a restoration of the

quality standards of commodities purchased by the farming community which could not always be maintained under the stress of war-time conditions. The Branch has been divided into three sections, viz.:—Inspectorial, Seed Testing, and Registration, with the sections led by experienced officers.

The following table sets out the work of the year (other than the large volume of emergency war-time work) with comparative total figures for the last two years:—

	1945.					Total.		
	Seeds.	Fertilizers.	Pest Destroyers.	Veterinary Medicines.	Stock Foods.	1943.	1944.	1945.
Samples received from—								
Inspectors of this Branch	389	6	14	5	15	1,018	370	429
Chief Quarantine Officer (Plants)	..	..	..	..	..	1	1	..
Dealers	1,156	2	24	..	219	1,465	1,284	1,401
Buyers	34	1	3	..	4	19	25	42
Government Departments	596	..	..	..	7	236	155	603
Referee, Repeat and Experimental Tests	488	..	..	..	..	528	432	488
Total Samples dealt with	2,663	9	41	5	245	3,267	2,267	2,963
Licenses issued	..	219	..	394	..	566	591	613
Registrations effected	..	145	27	14	136	942	485	322
Registrations refused	..	..	1	14	..	17	3	15
Board Meetings	..	..	3	3	..	7	4	6
Number of inspectional visits made to localities other than Brisbane	..	1	..	..	7	11	5	8
Analyses carried out for this Branch by the Agricultural Chemist	..	9	40	7	22	43	27	78
Prosecutions	..	..	..	..	..	1	..	..

SEEDS FOR SOWING.

In the course of the year, 2,663 samples were examined at the seed-testing station; 389 were taken by inspectors of the branch, of which 247 were samples of navy beans examined for the Department of Commerce and Agriculture, 1,156 from seed dealers, 34 from farmers, 596 from other Government sources, including 376 examined for the Vegetable Seeds Committee, and 488 representing repeats and experimental work. Of the samples examined, 270 did not reach the germination standard. The prohibited seed of *Datura* sp. was found in 7 samples, and Johnson Grass in one sample of Japanese millet seed.

FERTILIZERS.

Fertilizer registrations numbered 145. Two hundred and nineteen fertilizer licenses were issued. Nine samples were received and analysed by the Agricultural Chemist with satisfactory results.

FERTILIZER RATIONING.

The rationing of fertilizers for all crops has been carried out without any undue hitch. Large quantities of nitrate of soda were delivered by ship direct to North Queensland ports; this was a very satisfactory arrangement which expedited delivery. Because of the shortage of sulphate of ammonia, nitrogen requirements were met by nitrate of soda which had to be used on all crops to a much greater extent than in the past. This fertilizer carries a lower percentage of nitrogen than sulphate of ammonia and sells at the same price per ton. It has distinct limitations for use in Queensland, because of its hygroscopic nature. Numerous fires have caused loss of the fertilizer, sheds, and railway rolling-stock. In some instances, nitrate poisoning has resulted in the loss of animals due to their eating the lush growth resulting from spilt nitrate of soda.

Superphosphate, because of prevailing conditions, is still of 18 per cent. grade with a water soluble phosphoric acid content of 14 per cent.

The bulk of potash supplies are in the form of muriate salts with a potash content of 60 per cent. against 50 per cent. pre-war.

The amount of fertilizer used on all crops is as follows:—

	Tons.
Nitrate of soda	17,860
Sulphate of ammonia	8,668
Blood and bone	11,963
Superphosphate	16,209
Muriate of potash	2,233
Sulphate of potash	73
	57,006

This year, because of the shortage of sulphate of ammonia, the nitrogen content of pineapple mixture has been reduced by 20 per cent., and the standard mixture 10-6-10 has been replaced by the alternative mixtures 8-6-10 or 8-6-16.

During the period 1st August to 31st December, 1944, the position was such that it was necessary to reserve the whole of the available stocks of sulphate of ammonia for use in mixtures and ration on the basis of 40 lb. per 1,000 plants.

Even then, very careful husbandry of stocks was necessary to meet requirements. For growers on soils with a high potash content and who applied for straight sulphate of ammonia, a quantity of nitrate of soda was made available and rationed at the rate of 25 lb. per 1,000 plants.

During the period 1st January to 30th June, 1945, there was a slight improvement in the supply of sulphate of ammonia, and by retaining the alternative mixtures and rationing on a similar basis, it was possible to make available straight sulphate of ammonia—rationed at the rate of 26½ lb. per 1,000 plants.

Permits were issued to 1,228 pineapple growers, covering 67,037,634 pineapple plants. The amount of fertilizer issued on permits was 107 tons nitrate of soda, in addition to 896 tons sulphate of ammonia, 619 tons superphosphate, and 417 tons muriate of potash, of which 1,926 tons were sold as mixtures.

PEST DESTROYERS.

The year 1945 was the final in a three-yearly registration period. Twenty-seven pest destroyers were registered; 1 was refused registration. Samples numbering 41 were received, and 40 were analysed by the Agricultural Chemist. The supply of pest destroyers was closely watched and every endeavour made to ensure that stocks were available when and where needed.

Derris, an important non-poisonous insecticide, after being unobtainable for several years, was made available in ample quantities to meet requirements. The distribution of nicotine sulphate to and in Queensland was supervised by this branch and vegetable growers obtained adequate supplies. The shortage of arsenate of lead, previously reported, eased to a degree, but it was not practicable to completely satisfy all orders. The prospects of obtaining substantially increased quantities of this chemical in the immediate future are not bright. However, a very useful insecticide—D.D.T. may soon be available to offset largely any scarcity of lead arsenate.

VETERINARY MEDICINES.

As from the 1st January, 1945, the new three-year registration period commenced, which means that all preparations will come up for review by the Veterinary Medicines Board. So far, only 14 preparations have been registered. This small number is due to the fact that the Board decided to make a comprehensive review of all claims on labels and other advertising matter. A number of preparations will not be granted full registration until it is possible for the persons placing them on the market to have their labels reprinted, which can only be done when the paper shortage has eased. In addition to this, the prevailing conditions have greatly lessened the amount of time that can be devoted to this very necessary work. Preparations numbering 14 were refused registration by the Veterinary Medicines Board for various reasons. The number of licenses issued to sell veterinary medicines amounted to 394, and seven samples were analysed by the Agricultural Chemist.

STOCK FOODS.

Registrations totalled 136, as against 110 in the previous year. Twenty-two samples were analysed by the Agricultural Chemist. Because of shortage of ingredients, variations accordingly occurred in the formulae of stock foods, particularly

poultry mashes, but in the case of bran, pollard and meat and other meals, the diversion of these materials under a permit system to essential mixers enabled a degree of stabilization of the content of these ingredients in such mashes to be brought about.

STOCK FOOD RATIONING.

Because of the acute shortage of concentrates and the abnormal demand occasioned by dry seasonal conditions and increased requirements of food production, direct rationing by means of permits, of feeding meals of animal origin, i.e., blood, meat, meat and bone meals, commenced on the 1st October, 1944. A similar rationing scheme covering mill offals (bran and pollard) operated as from the 1st February, and the rationing of commercially prepared mashes by means of coupons from the 1st June, 1945, the ration periods being as follows:—1st October, 1944, to 31st January, 1945; 1st February, 1945, to 31st May, 1945; 1st June, 1945, to 30th September 1945.

In order that whatever supplies available would be utilised to the best advantage for food production, equal priority has been given to owners of dairy cattle supplying milk for human consumption, and to owners of poultry being kept for egg production, and pigs.

Rationing of mashes from the 1st June involved the handling of approximately 80,000 applications; because of staff shortages, considerable difficulty occurred in issuing rations as promptly as would be desired.

Because of the demands on the branch for rationing of various agricultural aids, it has not been possible to keep more than a superficial control on the quality of the various seeds, fertilizers, veterinary medicines, pest destroyers and stock foods being offered for sale.

It is estimated that approximately 85 per cent. of the efforts of the branch has been absorbed in work on rationing of fertilizers and stock foods.

F. B. COLEMAN,
Standards Officer.

GENERAL.

With the approach of the end of the war, and thereafter the inevitable diminution in Government purchases of agricultural products for the needs of the Allied Services, marketing difficulties may be expected to arise, especially in those agricultural industries the production of which has been stimulated to meet war-time demands. Producers in some such industries, which did not operate pre-war under any scheme of orderly marketing, but which during the war experienced controlled and stabilised conditions, now regard with some concern the possibility of having to return to unorganised conditions and seek the institution of marketing schemes to take the place of the *National Security Act* controls when the latter cease to operate.

In the restoration of agricultural industry to a peace-time basis full cognisance must be taken of international agreements on trading, tariffs, and commodity controls and their influence on Queensland's primary industries. There is need for industry surveys and collation of data to prepare for anticipated post-war consultations and industry modifications which call for urgent enlargement of the present Marketing Branch staff.

Following on the re-organisation within the Department, the staff of the division has been strengthened. Departmental activities in relation to both voluntary and compulsory co-operatives of primary producers are now appropriately centred within the Division of Marketing.

In the course of the year, preparation was made for the holding of a ballot of dairy farmers on the question of the setting up under section 30 of *The Primary Producers' Organisation and Marketing Acts* a compulsory organisation of producers of milk and cream. The preparation of the roll for the ballot, comprising some 23,000 names, has been completed by the Director and officers of the Division of Dairying.

In addition to the activities hereinbefore mentioned, the Director has continued his association with the work of the Queensland Emergency Supplies Committee, and other activities of a war-time character.

The reports of the Officer in Charge, Standards Branch, and of the Registrar of Primary Producers' Co-operative Associations are attached.

H. S. HUNTER,
Director of Dairying.

REPORT OF THE REGISTRAR OF CO-OPERATIVE ASSOCIATIONS.

Two new associations—Theodore Co-operative Dairy Carrying Association Limited, and The Bukali Co-operative Dip Association Limited—were registered under *The Primary Producers' Co-operative Associations Acts, 1923 to 1934*, in the year under review.

Total registrations now comprise 215 associations and two federations. As 20 associations have been wound up since the Acts came into operation, 195 associations and two federations remain on the register.

Licenses have been issued to 247 auditors, an increase of six for the year.

Several associations have amended their rules to conform with the provisions of the *Commonwealth Income Tax Acts*, which provide taxation concessions to co-operative bodies.

A. J. EVERIST,
Registrar of Primary Producers' Co-operative Associations.

REPORT OF THE EXECUTIVE OFFICER OF WAR AGRICULTURAL COMMITTEES.

The District War Agricultural Committee Organisation continued to function successfully and with advantage to primary producers throughout 1944-45, and each of the several sections handling applications for rural manpower and assistance from the Women's Land Army, and the release of essential machinery and materials to aid production, was kept very fully employed.

The Central Executive of the Organisation has maintained a close liaison with Commonwealth controlling authorities in order to ensure that Queensland obtained a fair allotment of available materials, but unfortunately transport difficulties sometimes retarded deliveries to this State.

Notwithstanding some difficulties and disappointments most of the problems submitted to the Central Executive were overcome.

SPECIAL SERVICE RELEASES FOR RURAL LABOUR.

The Commonwealth-wide scheme introduced the previous year for the release of nominated Service personnel for return to rural industries continued to operate, and many thousands of applications for release were investigated during the twelve months by District War Agricultural Committees and departmental officers.

The quota of releases to rural industry for the nine months to the end of June, 1945, was fixed by the Manpower Directorate at 7,700, but in March, 1945, a proportion of the quota was transferred to other industries, particularly building and allied trades and for the rubber industry.

The total number of applications recommended by District War Agricultural Committees which were subsequently approved by the Services was 5,050, distributed amongst the various sections of rural industry as follows:—

Dairying	2,812
Pastoral	545
Fruit and vegetables	238
Poultry farming	69
Sugar	1,054
General agriculture	61
Meat works	77
Bacon factory	40
Butter and cheese factory	81
Flour milling	22
Miscellaneous	51
Total	5,050

AUSTRALIAN WOMEN'S LAND ARMY (QUEENSLAND).

During the year a number of Land Army Camps were supplied with D.W.A.C. equipment and operated in Queensland with a total personnel of 201 women. In addition, approximately 150 women were working in individual billets on dairy farms, sheep and cattle stations, and vegetable and fruit farms.

Some continuous camps were established, but others were set up as required to provide labour for seasonal harvesting, such as cotton picking in the Callide Valley and the fruit and vegetable picking in the Stanthorpe district.

The present continuous camps are at Buderim, Victoria Point, Birkdale and Atherton. The Buderim camp was commenced in May, 1943, and the women engaged in cultivation and harvesting of small crops, chiefly ginger, beans and strawberries. At Victoria Point, which also commenced in May, 1943, and Birkdale, which commenced in August, 1943, the women have been producing and harvesting small crops and fruit. Atherton commenced in October, 1943, and the women engaged chiefly in the production and harvesting of vegetables for military requirements.

SEASONAL CAMPS.

Stanthorpe.—For the 1944-45 harvest, four Land Army camps, with a peak personnel of 200, were established. In the previous season, seven camps were operated, but during the past season the fruit crop was smaller because of frost.

Burdekin.—Five camps operated for the 1944-45 harvest of potatoes and tomatoes. In the 1945-46 season it is expected that 130 women will be employed in four camps between July and November.

Boonah.—Forty Women's Land Army personnel were employed to assist in harvesting the 1944 spring potato crop.

Gayndah.—Twenty women helped for five months in the citrus harvest of this district.

Gladstone.—For a short period in 1944, a Land Army Camp operated at Targinnie, harvesting tomatoes.

Redland Bay.—For about six months of each year, from six to fifteen women have been employed in this area, cultivating and harvesting vegetables and packing fruit.

Gympie.—During the peak of the bean harvest, seventy women were at work in individual billets.

In addition to the above, women have worked in billets as far north as Mossman, as far south at Wallangarra, and as far west as Longreach and Cunnamulla.

While the Manpower Directorate is responsible for the administration of the Women's Land Army, it is an important function of the D.W.A.C. organisation to arrange camp accommodation and to allocate Women's Land Army personnel within the districts.

PRISONER OF WAR RURAL LABOUR.

During the year, P.O.W. labour made a substantial contribution towards overcoming rural labour difficulties in many districts throughout the State. At the 30th June, 1945, the following numbers were employed in various districts in Queensland:—

Stanthorpe	168
Nambour	121
Gympie	183
Gayndah	96
Kenilworth	80
Home Hill	234
Kingaroy	132
Monto	112
Boonah	71
Total	1,197

Included in the figures for Home Hill are 53 prisoners of war who, in June, were transferred temporarily to Atherton to assist in the maize harvest. The crop there was the lightest for years, and Australian labour was unobtainable, as the daily earnings would have been too low.

There is, of course, a seasonal effect on employment of this class of labour, and the placement figures rise or fall from

month to month. Placements in the different rural industries at 30th June, 1945, were as follows:—

Dairying	462
Fruit and Vegetables	680
General agriculture	75

As from the 1st June, 1945, the weekly wage payable by farmers for prisoners of war was raised from £1 to £2 and keep. There was some resentment expressed by employers at this increase, but as most of the prisoners were by then experienced, most of the farmers were pleased to retain the men who had been allotted to them.

MACHINERY.

In the course of the past twelve months, a change for the better has taken place in the supply of all classes of agricultural machinery.

To date, 24,280 applications for types of machinery under control have been dealt with, and the following is a summary of releases made:—

Tractors (new or second-hand)	3,773
Engines	3,318
Windmills	3,325
Rotary hoes	613
Spraying plants	81
Irrigation equipment	307
Shearing equipment	401
Headers	18

There is still an unsatisfied demand for some of the machines subject to control—chiefly tractors, engines, windmills and irrigation equipment—and lack of stock has prevented the allocations being made.

There are prospects of a considerable improvement in this position before very long.

MATERIALS.

In the course of the year, hundreds of applications for wire, wire netting and bore casing have been dealt with directly by District War Agricultural Committees, and recommendations made for release in accordance with priorities. Similarly, D.W.A.Cs. have been called upon to act as recommending authorities for the release of tyres and tubes required for fitment to tractors and farm implements. By request of the Commonwealth authorities, all applications of this nature are certified by D.W.A.Cs. and transmitted to the Central Executive, for submission to the Tractor Tyre Advisory Committee. Because of heavy Army and industrial demands for welding gas, there is an acute shortage of cylinders, necessitating strict control by the Commonwealth authorities in granting priorities which will enable continuity of supply. In this connection also, D.W.A.Cs. have been called on to act as recommending authorities in order to ensure that repairs to farm implements can be effected without undue delay.

Hundreds of application for electric supply for purposes connected with rural production have been investigated by D.W.A.Cs.

The Central Executive of the War Agricultural Organisation has been represented at all meetings of the Welding Gas, Tractor Tyre, and Horsedrawn Vehicles, Saddlery and Harness Advisory Committees. In addition, numerous requests were received from primary producers regarding likely sources for the purchase of equipment and materials which are in short supply. These requests cover a wide field, ranging from civilian requirements to tools of trade, dairy utensils, farm implements, building materials, hessian, paraffin wax, wire rope, motor vehicles and beekeepers' requirements.

During the period of hostilities there has been a lag in deliveries of essential materials, causing a huge accumulation of unfilled orders. Particularly is this the case in respect of galvanised iron, fencing wire, wire netting, bore casing and piping. Most merchants are up to nine months in arrears with deliveries of high priority orders for wire netting, and six months with piping and bore casing, while the supply position in regard to galvanised iron in Queensland has been so acute that releases to farmers for roofing purposes could not be approved, unless the use of alternative materials was shown by the applicant to be quite impracticable.

H. BARNES,
State Executive Officer.

REPORT OF THE EDITOR OF PUBLICATIONS.

Throughout the year an extensive departmental information service was maintained. Requests for information on the rural industries of Queensland and conditions of land settlement, especially for ex-Servicemen, continued to increase in volume.

Queensland Agricultural Journal.—The value of the *Journal* in the extension work of the Department is widely recognised, and its circulation among farmers has increased considerably.

Queensland Journal of Agricultural Science.—Under the control of the part-time Associate Editor of Publications, Mr. C. W. Winders, this quarterly *Journal* has now an established place in agricultural science literature.

Photographic Service.—In addition to fulfilling increasing departmental requirements, the services of the Photographic Section were extended, as requested, to other Government Departments.

Central Library.—Largely through the exchange service with reciprocating countries and institutions, many important additions were made to the Central Library in the course of the year. Through the circulation of monthly accession lists, departmental officers and others concerned are kept informed

of the availability of new publications relating to the land industries. Sectional libraries within the Department also have been well-maintained.

Food Production Stimulation.—The departmental information service co-operated actively with the Commonwealth Department of Commerce and Agriculture in the war-time drive for increased food production, especially in respect of an intensive radio campaign which was continued vigorously throughout the year. For this purpose, no fewer than fifty radio scripts were prepared by the Editor of Publications, in addition to editorial collaboration in the preparation of documentary broadcasts and radio plays.

General Information Service.—The demand for information on crop and stock production under Queensland conditions continued to increase. In addition to departmental publications, the service included Press articles and the supply of authentic material to newspaper contributors. Other information on the contemporary agricultural situation was prepared, as required, and circulated through appropriate channels. In co-operation with the Army Education Service, the Editor delivered a lengthy series of lectures to the personnel of Army formations in the course of the year.

J. F. F. REID,
Editor of Publications.

